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1925/26

THE UNIVERSITY CALENDAR

1925-1926

AUTUMN QUARTER

Examination for admission, and for exemption from Freshman

English....Wednesday, Thursday, and Friday, September 23, 24 and 25
Registration days.....Monday, Tuesday, Wednesday, September 28, 29, 30
Instruction begins.....Thursday, October 1, 8 a.m.
Regular meeting of the Faculty.....Tuesday, October 20, 4 p.m.
Thanksgiving recess begins.....Wednesday, November 25, 6 p.m.
Thanksgiving recess ends.....Monday, November 30, 8 a.m.
Regular meeting of the Faculty.....Tuesday, December 15, 4 p.m.
Examinations for Admission

Wednesday, Thursday, and Friday, December 16, 17, and 18
Instruction ends.....Friday, December 18, 6 p.m.

WINTER QUARTER

Registration day.....Monday, January 4
Instruction begins.....Tuesday, January 5, 8 a.m.
Regular meeting of the Faculty.....Tuesday, January 26, 4 p.m.
Washington's birthday (holiday).....Monday, February 22
Regular meeting of the Faculty.....Tuesday, March 16, 4 p.m.
Examinations for Admission

Monday, Tuesday, and Wednesday, March 22, 23, and 24.
Instruction ends.....Wednesday, March 24, 6 p.m.

SPRING QUARTER

Registration day.....Monday, March 29
Instruction begins.....Tuesday, March 30, 8 a.m.
Campus day.....Friday, April 30
Regular meeting of the Faculty.....Tuesday, April 20, 4 p.m.
Memorial day (holiday).....Monday, May 31
Examinations for Admission

Wednesday, Thursday, and Friday, June 9, 10, 11
Instruction ends.....Friday, June 11, 6 p.m.
Class Day and Alumni Day.....Saturday, June 12
Baccalaureate Sunday.....Sunday, June 13
Commencement.....Monday, June 14

SUMMER QUARTER

Registration day.....Tuesday, June 15
Instruction begins.....Wednesday, June 16, 8 a.m.
Independence day (holiday).....Monday, July 5
Examinations for Admission

Wednesday, Thursday, and Friday, July 21, 22, 23
First term ends, second term begins.....Friday, July 23
Instruction ends.....Wednesday, August 25, 6 p.m.

NOTICE

The University and its various schools and departments reserve the right to change the rules regulating admission to the University and its schools, and any other regulations affecting the student body, or the granting of degrees. Such regulations shall go into force whenever the proper authorities may determine, and shall apply not only to prospective students, but also to those who may, at such time, be matriculated in the University. The University also reserves the right to withdraw courses at any time.

GRADUATE SCHOOL

THE FACULTY, 1925-1926

Henry Suzzallo, Ph.D. (Columbia), LL.D. (California).....	President
John Thomas Condon, LL.M. (Northwestern).....	Dean of Faculties
Frederick Morgan Padelford, Ph.D. (Yale).....	Professor of English; Dean of the Graduate School
Henry Landes, A.M. (Harvard).....	Professor of Geology and Mineralogy; Dean of the College of Science
Edmond Stephen Meany, M.L. (Wisconsin).....	Professor of History
Trevor Kincaid, A.M. (Washington).....	Professor of Zoology
Milnor Roberts, A.B. (Stanford).....	Professor of Mining Engineering and Metallurgy; Dean of the College of Mines
Frederick Arthur Osborn, Ph.D. (Michigan).....	Professor of Physics Director of Physics Laboratories
William Savery, Ph.D. (Harvard).....	Professor of Philosophy
David Thomson, B.A. (Toronto)...	Professor of Latin; Dean of the College of Liberal Arts
Charles Willis Johnson, Ph.D. (Michigan).....	Professor of Pharmaceutical Chemistry; Dean of the College of Pharmacy
Pierre Joseph Frein, Ph.D. (Johns Hopkins).....	Professor of Romance Languages
Theodore Christian Frye, Ph.D. (Chicago).....	Professor of Botany
Robert Edouard Moritz, Ph.D. (Nebraska) Ph.N.D. (Strassburg)...	Professor of Mathematics
Carl Edward Magnusson, Ph.D. (Wisconsin), E.E. (Minnesota).....	Professor of Electrical Engineering; Dean of the College of Engineering
Everett Owen Eastwood, C.E., M.A. (Virginia), S.B. (Massachusetts Institute of Tech- nology), Professor of Mechanical Engineering	
Herbert Henry Gowen, D.D. (Whitman), F.R.G.S., F.R.S.A.....	Professor of Oriental History, Literature and Institutions
Oliver Huntington Richardson, Ph.D. (Heidelberg).....	Professor of European History
Henry Kreitzer Benson, Ph.D. (Columbia).....	Professor of Chemical Engineering
John Weinzirl, Ph.D. (Wisconsin), Dr.P.H. (Harvard).....	Professor of Bacteriology
Hugo Winkenwerder, M.F. (Yale)...	Professor of Forestry; Dean of the College of Forestry
Vernon Louis Parrington, A.B. (Harvard), A.M. (Emporia).....	Professor of English
Frederick Elmer Bolton, Ph.D. (Clark).....	Professor of Education; Dean of the School of Education
Edwin John Vickner, Ph.D. (Minnesota).....	Professor of Scandinavian Languages
Effie Isabel Ralitt, M.S. (Columbia).....	Professor of Home Economics
Stevenson Smith, Ph.D. (Pennsylvania).....	Professor of Psychology
Allen Rogers Benham, Ph.D. (Yale).....	Professor of English
Fred Carlton Ayer, Ph.D. (Chicago).....	Professor of Education
John Nathan Cobb,.....	Professor of Fisheries and Director of the College of Fisheries
William Maurice Dehn, Ph.D. (Illinois).....	Professor of Chemistry
Howard Woolston, Ph.D. (Columbia).....	Professor of Sociology
Matthew Lyle Spencer, Ph.D. (Chicago).....	Professor of Journalism; Director of the School of Journalism
George McPhail Smith, Ph.D. (Freiburg).....	Professor of Inorganic Chemistry
Howard Thompson Lewis, A.M. (Wisconsin).....	Professor of Economics; Dean of the College of Business Administration
Burt Persons Kirkland, A.B. (Cornell).....	Professor of Forestry
Charles Edwin Weaver, Ph.D. (California).....	Professor of Geology
John Locke Worcester, M.D. (Birmingham School of Medicine).....	Professor of Anatomy
George Wallace Umphrey, Ph.D. (Harvard).....	Professor of Romance Languages
Eric Temple Bell, Ph.D. (Columbia).....	Professor of Mathematics
Edward D. Randolph, Ph.D. (Columbia).....	Professor of Education
Joseph Daniels, M.S. (Lehigh).....	Professor of Mining Engineering and Metallurgy
Charles William Harris, C.E. (Cornell).....	Professor of Civil Engineering
Friedrich Kurt Kirsten, B.S., E.E. (Washington).....	Professor of Electrical Engineering
William Daniel Moriarty, Ph.D. (Michigan).....	Professor of Business Administration
Alexander C. Roberts, Ph.D. (Washington).....	Professor of Education; Director of Extension Service

Charles Emanuel Martin, Ph.D. (Columbia)	Professor of Political Science
Edgar Allen Loew, B.S. (E.E.) (Wisconsin)	Professor of Electrical Engineering
Herbert Ellsworth Cory, Ph.D. (Harvard)	Professor in Liberal Arts
Roy Martin Winger, Ph.D. (Johns Hopkins)	Professor of Mathematics
Thomas Kay Sidey, Ph.D. (Chicago)	Associate Professor of Latin and Greek
Edward McMahon, A.M. (Wisconsin)	Associate Professor of American History
Edward Godfrey Cox, Ph.D. (Cornell)	Associate Professor of English
Allen Fuller Carpenter, Ph.D. (Chicago)	Associate Professor of Mathematics
George Burton Rigg, Ph.D. (Chicago)	Associate Professor of Botany
Charles Goggio, Ph.D. (Wisconsin)	Associate Professor of Romanic Languages
Roderick Duncan McKenzie, Ph.D. (Chicago)	Associate Professor of Sociology
Herman Vance Tartar, Ph.D. (Chicago)	Associate Professor of Chemistry
Eldin Verne Lynn, Ph.D. (Wisconsin)	Associate Professor of Pharmacology and Chemistry
Henry A. Langenhan, Ph.D. (Wisconsin)	Associate Professor of Pharmacy
Grace Goldena Denny, A.M. (Columbia)	Associate Professor of Home Economics
Curt John Ducasse, Ph.D. (Harvard)	Associate Professor of Philosophy
Walter Isaacs, B.S. (James Milliken)	Associate Professor of Fine Arts
William Henry George, Ph.D. (Harvard)	Associate Professor of Political Science
Dudley Daniel Griffith, Ph.D. (Chicago)	Associate Professor of English
Samuel Herbert Anderson, Ph.D. (Illinois)	Associate Professor of Physics
Bror Leonard Grondal, M.S.F. (Washington)	Associate Professor of Forestry
Edwin Ray Gurthrie, Ph.D. (Pennsylvania)	Associate Professor of Psychology
Hewitt Wilson, Cert. Eng'r. (Ohio State University)	Associate Professor of Ceramics
Edwin James Saunders, A.M. (Harvard)	Assistant Professor of Geology
Eli Victor Smith, Ph.D. (Northwestern)	Assistant Professor of Zoology
Clarence Raymond Corey, E.M. (Montana State School of Mines), A.M. (Columbia), Assistant Professor of Mining Engineering and Metallurgy.	
Ernest Otto Eckelman, Ph.D. (Heidelberg)	Assistant Professor of German
George Edward Goodspeed, Jr., B.S. (Massachusetts Institute of Technology)	Assistant Professor of Geology.
Curtis Talmadge Williams, Ph.D. (Clark)	Assistant Professor of Education
Martha Koehne, A.M. (Ohio)	Assistant Professor of Home Economics
Leslie Spier, Ph.D. (Columbia)	Assistant Professor of Anthropology
Henry L. Lucas, Ph.D. (Michigan)	Assistant Professor of History
Jakob A. O. Larsen, A.M. (Oxford)	Assistant Professor of History
Theresa Schmid McMahon, Ph.D. (Wisconsin)	Assistant Professor of Economics
Louis Peter DeVries, Ph.D. (Wisconsin)	Assistant Professor of Romanic Languages
August Dvorak, Ph.D. (Minnesota)	Assistant Professor of Education
Rachel Emilie Hoffstadt, Ph.D. (Chicago), Dr.S. (Johns Hopkins)	Assistant Professor of Bacteriology.
John Earl Guberlet, Ph.D. (Illinois)	Assistant Professor of Zoology
Robert Cunningham Miller, Ph.D. (California)	Assistant Professor of Zoology
Frank Joseph Laube, M.A. (Washington)	Assistant Professor of Political Science
Ralph Mason Blake, Ph.D. (Harvard)	Instructor in Philosophy
Forest Jackson Goodrich, M.S. (Washington)	Instructor in Pharmacy and Materia Medica
Graduate Council: Dean Padelford, Chairman; Deans Condon, Thomson, Roberts, Magnusson, and Lewis; Professors Meany, Osborn, Frye, Moritz, Dehn, Woolston, Williams, and Guthrie.	

GENERAL STATEMENT

The Aims of Graduate Study.—The principal aims of graduate study are the development of intellectual independence through cultivation of the scientific attitude of mind, and promotion of the spirit of research. The graduate student is therefore thrown more largely upon his own resources than the undergraduate, and must measure up to a more severe standard. The University is consistently increasing the emphasis on graduate work in order that it may be a strong center for advanced study.

Organization.—The Graduate School was formally organized in May, 1911. The graduate faculty consists of men offering courses primarily designed for graduate students.

Fees.—Graduate students pay a tuition fee of \$15 a quarter for the autumn, winter and spring quarters, if residents of the State of Washington or of Alaska, or \$50 a quarter for each of these quarters if non-residents. The regular fee for the summer quarter is \$20 for students at the University; \$17, including a \$5 laboratory fee, for students at the Biological Station.

Members of the staff on a full-time teaching schedule are relieved of all tuition. Teaching fellows, graduate scholars—formerly known as graduate assistants and graduate readers—and non-instructional employees of the University pay a tuition fee of one dollar per quarter for each credit hour on the election blank.

Incidental fees, such as library and laboratory fees, are required from all who receive graduate instruction.

LIBRARY FACILITIES

The University general library contains 145,547 volumes, and receives virtually all of the publications of learned societies. The law library contains approximately 37,000 volumes, and there are well equipped departmental libraries in chemistry, English, mathematics, education, and biological science. The Seattle public library of some 350,000 volumes is open to students without charge.

Collections of special significance are mentioned in the departmental announcements.

SPECIAL FACILITIES

Bailey and Babette Gatzert Foundation for Child Welfare.—On December 21, 1910, this foundation was established by a gift to the University of \$30,000. The purpose of the foundation is (1) to conduct a laboratory for the mental and physical examination of children to determine their individual defects and aptitudes and, in accordance with the results of the examination, to suggest the best means of education and treatment; (2) to assist in establishing child welfare agencies and child study laboratories throughout the state, and (3) to carry on research in child psychology.

The Alice McDermott Memorial Fund.—The late Mrs. Josephine P. McDermott made provision in her will for the establishment of the Alice McDermott Memorial Fund at the University of Washington. The amount of this bequest is one hundred thousand dollars (\$100,000) to be used for one or both of the following purposes:

1. Research work in or in connection with the University of Washington tending to promote the prevention or cure of tuberculosis.
2. The purchase of radium for research work in connection with disease or for actual treatment thereof.

Engineering Experiment Station.—The purpose of the station is to aid in the industrial development of the state and nation by scientific research and by furnishing information for the solution of engineering problems.

The scope of the work is two-fold:

1. To investigate and to publish information concerning engineering problems of a more or less general nature that would be helpful in municipal, rural, and industrial affairs;
2. To undertake extended research and to publish reports on engineering and scientific problems.

Every effort will be made to cooperate effectively with professional engineers and the industrial organization in the state. Investigations of primary interest to the individual or corporation proposing them, as well as those of general interest, will be undertaken through the establishment of fellowships.

For administrative purposes, the work of the station is organized into eight divisions: (1) Forest products, (2) mining, metallurgy and ceramics; (3) aeronautical engineering, (4) chemical engineering and industrial chemistry, (5) civil engineering, (6) electrical engineering, (7) mechanical engineering, (8) physics standards and tests.

Puget Sound Biological Station.—The Puget Sound Biological Station, open during the summer quarter for classes and to research workers by special arrangement at other times, is located at Friday Harbor in San Juan County. This region is unsurpassed in natural advantages for a marine biological laboratory, perhaps the most fortunate in the country. The very varied conditions result in the presence of a very diverse flora and fauna. The protected shores make it easy and comparatively safe to get about.

The sea life embraces a great abundance of the following animal forms: hydroids, echinoderms, shore crabs, worms, bivalves, gastropods, nudibranchs, star fish, sea urchins, anemones, sea-cucumbers and barnacles, medusae and jelly fish, and a hundred species of other fish. Water fowl nest on rocky cliffs.

All of the four groups of algae are abundantly represented, between 75 and 100 species being found, exclusive of microscopic forms. Among the brown algae, the kelps predominate, *Nereocystis* being the most abundant, though the other species of kelp are common. *Fucus* is the most prevalent of the rock weeds. Among the red algae are *Polysiphonia Gigartina*, *Porphyra* and *Ampiroa*; among the green algae, *Ulva*, *Enteromorpha* and *Codium*; and among the blue-green algae, *Nostoc* and *Dermocarpa*. Diatoms of many forms abound.

With this rich fauna and flora, some of which are available in shore work and others brought up by the dredge, there are large opportunities for work in taxonomy, morphology, cytology, ecology and physiology. Since the region is still somewhat new scientifically, there is much important work to be done in taxonomy and local distribution. As there are several forms of which the life history is not completely known, the morphological work is attractive. The problems in physiology, both in the field and in the laboratory, are numerous. The opportunities for work in ecology are excellent and many of them will have important economic bearing on fisheries problems. Thus among the important lines of investigation may be mentioned study of the diatoms, bacteria, and various fish parasites.

The University owns 484 acres with about two miles of shore line, and the state has made the whole county a marine preserve. Three new buildings have been erected within the last two years; two of them are permanent fireproof laboratory buildings. The station publishes a series, now in its third volume, known as the Publications of the Puget Sound Biological Station. There is a station library of about 1,000 volumes.

LABORATORIES

The University has well-equipped laboratories for advanced work in anatomy, astronomy, botany, ceramics, chemistry, civil, chemical, electrical, mechanical and mining engineering, fisheries, forestry, geology, metallurgy, pharmacy, physics, psychology and zoology.

GRADUATE FELLOWSHIPS AND SCHOLARSHIPS

Loretta Denny Fellowships.—Three fellowships, of \$500 each, open to graduate students in any department of the University. Awarded by the faculty on the basis of scholastic excellence and general merit, but only to those who need financial assistance. Applications should be made on blanks supplied by the dean of the Graduate School and must be in his hands on or before March 15 preceding the academic year for which the fellowships are to be granted.

Arthur A. Denny Fellowships.—Six fellowships of \$500 each, open to graduate students in the departments of civil engineering, education, English, history, mining engineering, and pharmacy respectively. Awarded by the departments concerned on the basis of scholastic excellence and general merit, but only to those who need financial assistance. Applicants must be residents of the state of Washington. Application should be made to the heads of departments concerned on blanks supplied by them, and must be in their hands on or before March 15 preceding the academic year for which the fellowships are to be granted.

National Research Fellowships.—Fellowships in physics and chemistry, offered by the National Research Council, are open to promising research students, who have already taken the doctor's degree or have equivalent qualifications. A successful candidate can pursue his research at any university or research institution chosen by him and which is acceptable to the appointing board. The salary will ordinarily be \$1800 for the first year. Fellows are eligible for successive reappointments ordinarily with increase in salary. For details address the dean of the Graduate School or the heads of the departments.

University Honorary Fellowships.—Three honorary fellowships have been established by the University. These, like the Loretta Denny fellowships, are open to students in any department of the University. They carry no stipend, and are designed to furnish recognition of exceptional scholastic excellence in the case of graduate students who are not eligible for the Loretta Denny or the Arthur A. Denny fellowships, either because they do not need financial assistance or because they are not giving their entire time to their work in the University.

Research Fellowships in Mining and Metallurgy.—The College of Mines of the University in cooperation with the United States Bureau of Mines offers five fellowships in mining and metallurgical research. The fellowships are open to graduates of universities and technical schools who are properly qualified to undertake research work. The value of each fellowship is \$720 per year of twelve months. Fellowship holders are required to register as graduate students and to become candidates for the degree of master of science in mining engineering or metallurgy, unless an equivalent degree has previously been earned. Applications are due not later than April 20, and should be addressed to the Dean, College of Mines, University of Washington, Seattle, Washington.

Du Pont Fellowship.—Through its chemical department, Du Pont de Nemours & Co. offer a scholarship of \$700 in chemistry, known as the "Du

Pont Scholarship," open to a senior student or graduate student in chemistry or chemical engineering.

The Bon Marche Industrial Fellowship.—The Bon Marche of Seattle offers an annual fellowship of \$600 to a graduate student in Home Economics for research work in textiles. The recipient of this fellowship is required to give one-fourth of her time for eleven months to testing of textiles for the Bon Marche.

The Effie I. Raitt Fellowship.—The Effie I. Raitt fellowship of \$600 is offered annually to a graduate student in home economics for research work in nutrition.

University Teaching Fellowships.—The University each year provides a number of teaching fellowships in various departments. The graduate student receiving such a fellowship divides his time equally between his studies and assistance in the teaching work of the department in which he is enrolled. These fellowships range from \$540 to \$720.

Graduate Scholarships.—A number of graduate scholarships are open to students who perform service as laboratory assistants, assistants in charge of quiz sections, or readers. The remuneration is proportioned to the service, and ranges from \$180 to \$360.

Rosenberg Scholarship.—A scholarship of \$200, known as the "Samuel Rosenberg Scholarship, endowed in loving memory by Ella S. Rosenberg, his wife," is open to graduate students in French.

ADMISSION

Three classes of students are recognized in the Graduate School:

1. Candidates for the master's degree.
2. Candidates for the doctor's degree.
3. Students not candidates for a degree.

Admission.—A graduate of the University or of any other institution of equal rank, will be given full graduate standing. Before being recognized as a candidate for a degree, however, a student must be approved by a committee appointed by the dean of the Graduate School, which shall also constitute the advisory committee to oversee the student's subsequent work. Unless the committee is already sufficiently acquainted with the candidate's capacity and attainments, there shall be a conference of the committee and the candidate, the purpose of which is two-fold:

(a) To determine whether the student has the quality of mind and the attitude toward advanced work which would justify his going on for an advanced degree.

(b) To satisfy the major and minor departments and the graduate council that the student has the necessary foundation in his proposed major and minor subjects. If he lacks this foundation, he will be required to establish it through undergraduate courses or supervised reading.

If the student is from a college or university which falls below a satisfactory standard in curriculum, efficiency of instruction, equipment or requirements for graduation, he may be required to take other undergraduate courses in addition to those required as a foundation in the major and minor subjects.

As soon after matriculation as feasible, a candidate for an advanced degree must file with the dean of the Graduate School an outline of his proposed work, on a blank provided for that purpose. This blank is sub-

mitted to the advisory committee for acceptance or modification. When it has received approval of the graduate council and the student has been notified, he will be regarded as a candidate for a degree.

Students on the Staff.—Assistants, associates, or others in the employ of the University are normally permitted to carry five hours of graduate work if full-time employees, and ten to twelve hours if half-time employees. Permission to exceed these hours must be secured from the dean of the Graduate School and the dean of Faculties.

Graduate Study in the Summer.—As the summer offers leisure for advanced study to a large number of teachers, the University lays special emphasis on graduate work during the summer quarter. Graduates of colleges or universities in attendance then are urged to enroll for the strictly graduate courses as these courses give an opportunity to work with a select group of mature students toward the acquisition of an advanced degree.

Graduate students will enroll with the dean of the Graduate School.

Attendance during three summer quarters will satisfy the residence requirement for the master's degree. A fair amount of credit toward the doctor's degree may also be earned in the summer quarter.

Graduate Credit for Home Study Courses.—(1) Students who have received bachelors' degrees elsewhere may earn graduate credits through Home Study under the following limitations:

a. Nine credits (one-fifth of the normal requirements for the master's degree) may be earned in approved Home Study courses of graduate standing.

b. Such students must, however, meet the residence requirement of three full quarters.

(2) Students who have earned bachelors' degrees from the University of Washington may earn graduate credits through Home Study under the following limitations:

a. Nine credits (one-fifth of the normal requirement for the master's degree) may be earned in approved Home Study courses of graduate standing.

b. Such students must meet a residence requirement of two and a half quarters.

DEGREES

THE DOCTOR'S DEGREE

Doctor of Philosophy.—Graduate students will be received as candidates for the degree of doctor of philosophy in such departments as are adequately equipped to furnish the requisite training. Each department introduces its program of courses with a specific statement of the graduate training that it is prepared to direct, and of the distinctive opportunities that it offers for graduate work. This degree is conferred only on those who have attained proficiency in a chosen field and who have demonstrated their mastery by preparing a thesis which is a positive contribution to knowledge.

The requirements for the degree of doctor of philosophy are as follows:

1. At least three years of graduate work, of which not less than one year must be spent in residence at the University of Washington. If a candidate is otherwise engaged in any regular employment, a correspondingly longer period of study will be required.

2. Completion of courses of study in a major and two minor subjects, the work in the minors to constitute approximately one-third of this work. The marks for graduate students shall be "passed" or "failed." In courses open to undergraduates and graduates, the passing grade for a graduate student shall be "B" or above if the course is in his major subject, "C" or above, if the course is in his minor subject. Before being recognized as a candidate for the degree, a student must be approved by a committee as provided above.

These courses of study cover at least two years of work. The work of the first year is virtually identical with that for the master's degree, and normally the candidate will wish to take this degree incidentally; the work of the second year is of still more advanced character. Not earlier than the end of the second year and at least a year before the time when the candidate expects to take the degree, the major and minor departments supplemented by a representative from the graduate council, shall submit the candidate to a careful oral and written examination, to determine whether he has the native equipment and the scholarship to warrant him in continuing.

3. The preparation of a thesis, as stated above, embodying the results of independent research. This thesis may properly be initiated in the second year, and should occupy the greater part of the third year. If the thesis is of such a character, or falls in such a department, that it requires library or laboratory facilities beyond the resources of the University, the student will be required to carry on his investigation at some other university, at some large library, or in some special laboratory. This thesis must be approved by a committee appointed by the major department, of which the instructor in charge of the thesis shall be a member, and also by a special committee from the graduate council.

4. Examinations as follows:

The Preliminary Examination.—An oral and written examination, covering the major and minor subjects. In so far as the examination is oral, it shall be before a committee appointed by the dean of not less than three representatives of the major department, not less than one representative of each of the minor departments, and a representative of the graduate council. The preliminary examination will normally be taken not less than two quarters before the final examination.

The Final Examination.—An oral, or oral and written examination, covering the work of the candidate, especially that part of it in which the thesis falls. The examination shall be given by a committee appointed by the dean including, so far as feasible, all of the instructors with whom the student has worked and a representative of the graduate council. If there is division of opinion in the committee in charge of either examination, the case shall be decided by the graduate council, with right of appeal to the graduate faculty.

5. Evidence of a reading knowledge of scientific French and German and of such other languages as individual departments may require. Such evidence must be filed with the dean and approved by him at least one academic year before the degree is granted. Only in rare cases shall the requirement of a reading knowledge of scientific French and German be waived, and then only when, in the judgment of the council, substitutions for either or both of these languages will be to the advantage of the student's training.

6. One copy of the thesis in typewritten form (or library hand) shall be bound at the expense of the candidate and deposited with the librarian

for permanent preservation in the University archives, at least four weeks before the date on which the candidate expects to take the degree.

The thesis, or such parts thereof, or such a digest as may be designated by the council, shall be printed. The candidate shall contribute \$100 to a fund for printing of theses, whether his thesis appears in the University series or elsewhere. From this fund the library is provided with 150 copies and the candidate with 50 copies.

7. A card certifying that all courses and examinations have been passed and that the thesis has been accepted and properly filed in the library, shall be presented to the dean at least one week before graduation. This card must bear the signatures of all major and minor instructors in charge of the student's work, of the committee appointed by the major department to pass on the thesis, and of the librarian or his appointed representative.

THE MASTER'S DEGREE

Master of Arts.—The degree of master of arts implies advanced liberal training in some humanistic field, gained through intensive study of one of the liberal arts supplemented by study in one or two supporting subjects. This detailed study culminates in a thesis which, if not an actual contribution to knowledge, is concerned with the organization and interpretation of the materials of learning. Creative work of a high quality may be offered in lieu of a thesis.

Master of Science.—The degree of master of science implies training similar to the above in some province of the physical or biological sciences. The thesis for this degree, however, must be an actual contribution to knowledge.

The requirements for the degrees of master of arts and master of science are as follows:

1. At least three full quarters or their equivalent spent in undivided pursuit of advanced study. If a candidate has done graduate work elsewhere, his program may be slightly less exacting, but this work must pass review in the examination, and shall not reduce the residence requirement at this University.

2. Completion of a course of study in a major and one or two minor subjects and of a thesis which lies in the major field. The work in the major and minor subjects shall total not less than 36 hours, of which 24 are normally in the major. The thesis normally counts for 9 hours in addition. The marks for graduate students shall be "passed" or "failed." In courses open to undergraduates and graduates, the passing grade for a graduate student shall be "B" or above if the course is in his major subject, "C" or above, if the course is in his minor subject.

The requirements of a minor or minors may be waived, but only on recommendation of the head of the major department and with the consent of the graduate council.

No work in the major subject may be counted toward the master's degree until the candidate has complied with the departmental requirements as to previous work in that subject, which in no case shall be less than eighteen hours.

Elementary or lower division courses may not count toward the minor requirement, and teachers' courses may not count toward either the major or minor requirements.

3. The preparation of a thesis, as defined above.

4. An oral, or written, or an oral and written examination, given by a committee appointed by the head of the major department, including so far as feasible, all the instructors with whom the student has worked. If

division of opinion exists among the examiners, the case shall be decided by the graduate council, with right of appeal to the graduate faculty.

5. The candidate's thesis shall be in charge of the instructor in whose field the subject falls, and it must be approved by a committee of the major department, of which the instructor in charge shall be a member. If the committee is divided in opinion, the case shall be decided by the graduate council, with right of appeal to the graduate faculty. At least two weeks before the date on which the candidate expects to take the degree, one copy of the thesis in typewritten form or printed form (or library hand, in case the thesis is of such a character that it cannot be typewritten) shall be deposited with the librarian for permanent preservation in the University archives. The thesis must meet the approval of the librarian as to form, and the cost of binding must be deposited with the thesis.

6. A card certifying that all courses and examinations have been passed, and that the thesis has been accepted and properly filed in the library, shall be presented to the dean at least one week before graduation. This card must bear the signatures of all instructors in charge of the student's work, of the instructors in charge of the thesis, and of the librarian or his appointed representative.

Master of Science in Technical Subjects.—The degree of master of science is given in technical subjects as follows:

- Master of Science in Chemical Engineering
- Master of Science in Civil Engineering
- Master of Science in Electrical Engineering
- Master of Science in Mechanical Engineering
- Master of Science in Ceramic Engineering
- Master of Science in Coal Mining Engineering
- Master of Science in Geology and Mining
- Master of Science in Metallurgy
- Master of Science in Mining Engineering
- Master of Science in Forestry
- Master of Science in Fisheries
- Master of Science in Pharmacy

The requirements for these degrees are essentially the same as those for the degrees of master of arts and master of science.

Master's Degree in Technical Subjects.—The master's degree is given in technical subjects as follows:

- Master of Forestry
- Master of Business Administration
- Master of Laws
- Master of Fine Arts

The requirements for these degrees are essentially the same as those for the degree of master of arts and master of science, with the exception that all the work may be in the major.

PROFESSIONAL DEGREES

Professional Degrees.—The professional degrees of chemical engineer, civil engineer, electrical engineer, mechanical engineer, metallurgical engineer and engineer of mines may be conferred in three years on those who hold the bachelor of science degree in their respective lines from the University of Washington, who give evidence of having engaged continuously in acceptable engineering work and who present satisfactory theses.

COURSES OF STUDY

ANATOMY

Science Hall and Anatomy Building

COURSES FOR UNDERGRADUATES AND GRADUATES ONLY

GROSS ANATOMY

101, 102, 103. *General Human Anatomy*.—Thorough study of the human body. Osteological collections are available. Especially for students taking the pre-medical, nurses', or physical education courses; open to others. Prerequisite, Zool. 1 and 7 or their equivalent. Lab. fee, \$7.50. Three or six credits a quarter; autumn, winter, spring. Worcester.

104. *Topographic Anatomy*.—Cross and sagittal sections for correlation. Prerequisites, Anat. 101, 102, and 103. Lab. fee, \$5. Four credits; autumn, winter, and spring. Worcester.

MICROSCOPIC ANATOMY

105, 106. *Histology and Embryology*.—Microscopic anatomy of developing and adult mammals studied both in their fresh and fixed conditions. Especially for students in pre-medical and nurses' courses but open to others. Prerequisite, Zool. 1 and 7 or their equivalent. Lab. fee, \$3. Six credits a quarter; autumn and winter. Worcester.

107. *Neurology*.—Dissection of the human brain and cord and special organs of sense; comparative developmental history of the central nervous system; a microscopic study of the nuclei and fiber tracts. Prerequisites, Anat. 105 and 106 or their equivalents. Especially for pre-med students but open to others. Lab. fee, \$3. Six credits a quarter; spring. Worcester.

COURSES FOR GRADUATES ONLY

200. Graduate and research work in anatomy for those qualified. Credits and time arranged. Autumn, winter, spring. Worcester.

ANTHROPOLOGY

Philosophy Hall

101. *Basis of Civilization*.—Factors that determine the growth of civilizations, as illustrated by the North American Indians. Five credits; winter. Spier.

*110. *Peoples of Europe*.

141. *Folk-Tales*.—Historical and psychological analyses. Research problems. Three credits; winter. Spier.

*143. *Origins of Art*.

163. *Anthropometry*.—Growth of children; racial and social influences. Methods and interpretation of measurements. Race classifications. Three credits; autumn. Spier.

185. *Primitive Social and Political Institutions*.—Theories of development. Five credits; autumn. Spier.

190, 191, 192. *Research*.—Instructor's permission necessary. Credits and hours to be arranged. Spier.

COURSES FOR GRADUATES ONLY

204, 205. *Anthropological Methods and Theories*.—Analysis of culture; historical and psychological methods; theories of culture growth. Three credits a quarter; autumn, winter. Spier.

BACTERIOLOGY AND PATHOLOGY

Science Hall

The department possesses an excellent library, including leading journals, and the laboratories are well supplied with apparatus. Local industries furnish practical problems for investigation and local hospitals supply clinical material. Practical routine experience may be obtained in state, city and other laboratories located in Seattle.

The department provides training leading to an advanced degree.

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

101. *General Bacteriology*.—Technique in growing and examining bacteria, identification of species, common disease bacteria. Prerequisite, junior standing except for bacteriology majors. Knowledge of biology and general chemistry is desirable. Lab. fee, \$4. Five credits; autumn, spring, summer. Weinzirl and Hoffstadt.

102. *Sanitary Bacteriology*.—Water supplies and sewage disposal; meat, milk and other foods; certain industrial applications. Prerequisite, Bact. 101. Lab. fee, \$4. Five credits; winter. Weinzirl and Hoffstadt.

103. *Public Hygiene*.—Conservation of health; prevention of diseases; school hygiene; industrial hygiene, etc. Prerequisite, junior standing except for bacteriology majors. Five credits; lectures only; spring. Lab. fee, \$1. Weinzirl.

104. *Serology*.—Types of immunity; immunization in animals and man; study of immune products. Prerequisite, Bact. 101. Lab. fee, \$5. Four credits; autumn. Hoffstadt.

105. *Infectious Diseases*.—Detailed study of the pathogenic bacteria, and methods of diagnosis of infectious diseases. Prerequisite, Bact. 101. Lab. fee, \$5. Four credits; winter.

106. *Clinical Diagnosis*.—Examination of blood, urine, gastric and intestinal contents, parasites, etc. Prerequisite, Bact. 101. Lab. fee, \$5. Four credits; spring. Magnusson and Hoffstadt.

111. *Pathology*.—Gross and microscopic study of inflammation and degeneration. Prerequisite, Anat. 105. Lab. fee, \$5. Five credits; winter. Hoffstadt.

112. *Pathology*.—Gross and microscopic study of tumors. Prerequisite, Bact. 111. Lab. fee, \$5. Five credits; spring. Hoffstadt.

120, 121, 122. *Applied Bacteriology*.—By special arrangement the student may spend not less than 15 hours per week in state or city laboratories. Credit will depend upon a satisfactory statement from the director in charge of the laboratories. Five credits; autumn, winter, spring, summer. Weinzirl.

190, 191, 192. *Research*.—Investigation of assigned problems. Open to qualified students after consultation. Credits to be arranged; autumn, winter, spring, summer. Weinzirl.

195, 196, 197. *Seminar*.—Topics not included in the regular courses; reports on research work done by the members. Prerequisite, Bact. 106. Credits to be arranged; autumn, winter, spring. Weinzirl.

COURSES FOR GRADUATES ONLY

204, 205, 206. *Advanced Bacteriology*.—Advanced work in definite fields on consultation. For 1925-6, and alternate years thereafter, the following topics will be handled in the conference: autumn, bacterial enzymes, Weinzirl; winter, bacterial plant diseases, Hotson; spring, industrial bacteriology, Weinzirl.

For 1926-7, and alternate years thereafter: autumn, compliment fixation, Hoffstadt; winter, ultraviruses and bacteriophage, Hoffstadt; spring, chemical pathology of the blood, Hoffstadt. Five credits; autumn, winter, spring, summer. Weinzirl.

BOTANY

Science Hall

The department has a fair working library distributed between the general library and the sub-library in Science Hall.

The Northwest is a most excellent location for botanical work. The rainfall is heavy in winter and freezing is not sufficient to kill the vegetation entirely. Salt water is only four miles from the University, and one can get all the altitude ranges from sea level to 14,000 feet in one hundred miles horizontal travel.

The University has the Puget Sound Biological Station at Friday Harbor, about ninety miles from the University. Here arrangements can be made for winter work if it seems desirable. The station is open two or three months every summer, and has proved to be a splendid place for working out some of the problems of the Northwest. The natural conditions are virtually unexcelled for botanical work.

The department offers a number of teaching fellowships to graduate students. These cover living expenses and fees at the University.

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

105, 106, 107. *Morphology and Evolution*.—Morphological study of types to show advances in composition. Required for all majors unless courses 11 and 12 are taken in the freshman year. Prerequisite, 10 hours botany, or Zool. 1 and 2. Lab. fee, \$3. Five credits a quarter; autumn, winter, spring. Frye and assistant.

111. *Forest Pathology*.—Recognition and treatment of common wood destroying fungi. Prerequisite, Bot. 11 or 105. Lab. fee, \$2. Five credits; autumn. Hotson and assistant.

119. *Plant Histology*.—Preparation of slides for the microscope; a study of tissues. Prerequisite, Bot. 106. Lab. fee, \$3. Two to five credits; any quarter. Frye.

140, 141, 142. *General Fungi*.—Morphology and classification of fungi as a basis for plant pathology. Prerequisite, Bot. 11 or 105, junior standing. Lab. fee, \$2. Five credits a quarter; autumn, winter, spring. Hotson.

143, 144, 145. *Plant Physiology*.—Prerequisite, three quarters of botany and Chem. 21, 22. Lab. fee, \$3. Five credits a quarter; autumn, winter and spring. Rigg.

180, 181, 182. *Plant Pathology*.—Diseases of plants and the fungi which produce them. Prerequisite, Bot. 142. Lab. fee, \$2. Five credits a quarter; autumn, winter, spring. Hotson.

190, 191, 192. *Rusts*.—Morphology and classification of the Uredinales.

Prerequisite, Bot. 142. Lab. fee, \$2. Five credits a quarter; autumn, winter, spring. Hotson.

COURSES FOR GRADUATES ONLY

200. *Proseminar*.—Semi-independent work by students. Open only on consultation with the head of the department. Lab. fee, \$2. Two to five credits; any quarter. Frye.

233. *Research*.—Lab. fee, \$2. Two to five credits; any quarter. Frye.

247. *Diatoms*.—Prerequisite, Bot. 53 or 105. Lab. fee, \$2. Three credits; autumn quarter. Frye.

250. *Algae*.—Prerequisite, Bot. 105. Lab. fee, \$2. Credits to be arranged; any quarter. Frye.

251. *Bryophytes*.—Prerequisite, Bot. 106. Lab. fee, \$2. Credits to be arranged; any quarter. Frye.

271, 272, 273. *Experimental Morphology*.—Prerequisites, Bot. 106, 145, one year chemistry. Lab. fee, \$2. Two credits a quarter; autumn, winter, spring. Frye.

279. *Colloidal Biology*.—Prerequisites, Bot. 143, Chem. 132. Lab. fee, \$3. Five credits; any quarter. Rigg.

280. *Micrometabolism*.—Prerequisites, Bot. 12 or 107, 148. Lab. fee, \$3. Five credits; any quarter. Rigg.

CHEMISTRY

Bagley Hall

The department of chemistry is fully equipped with apparatus and chemicals necessary for investigation along conventional lines pursued in the best large universities. A departmental library, ample and convenient for general study and research, special apparatus and machinery for industrial and engineering chemistry, scholarships, and fellowships for students of exceptional aptitude for research, and faculty guidance by productive research workers in special lines, contribute not only to the successful pursuance of problems constituting master's and doctor's theses but lead to the solving of special industrial problems and processes.

109. *Quantitative Analysis*.—Gravimetric analysis. Prerequisite, Chem. 23 or its equivalent. Two lectures and three laboratory periods a week. Five credits; winter, spring. Thompson.

110. *Quantitative Analysis*.—Volumetric analysis. Two lectures and three laboratory periods a week. Prerequisite, Chem. 109. Five credits; autumn, spring. Thompson.

121, 122, 123. *Industrial Chemistry*.—Autumn—fuels, gases, cements, refractories, iron, steel, and alloys; winter—processes for manufacture of acids, alkalies; spring—organic industrial chemistry, oils, fats, paints, rubber, cellulose products. Three lectures and two laboratory periods a week. Prerequisite, Chem. 52, 111 or equivalent. Five credits a quarter; autumn, winter, spring. Benson, Beuschlein.

128-129. *Organic Chemistry*.—For medical, chemical, engineering and technical students. Three lectures and two laboratory periods a week. Prerequisite, Chem. 22 or its equivalent. Five credits a quarter; winter, spring. Powell.

131, 132, 133. *Organic Chemistry*.—For major students in chemistry and for students in the College of Science. Three lectures and two laboratory periods a week. Prerequisite, Chem. 23 or its equivalent. Five credits; autumn, winter, spring. Dehn.

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

*150. *Industrial Seminar*.

153. *Organic Analysis*.—Special methods used in the analysis of organic substances. Prerequisite, Chem. 133 and 110. Credits and laboratory period to be arranged. Autumn. Dehn.

154, 155. *Advanced Quantitative Analysis*.—Special methods of analytical chemistry. Either quarter may be taken independently. Prerequisite, Chem. 111 or its equivalent. One lecture and two laboratory periods. Three credits; autumn, winter. Thompson.

161-162. *Physiological Chemistry*.—For students of medicine, biology, bacteriology and nutrition. Deals with chemical constitution, reactions, and products of living material both plant and animal. Prerequisite, Chem. 111 and 131 or equivalent. Three lectures and two laboratory periods. Five credits; autumn, winter. Boynton.

163. *Physiological Chemistry*.—Study of normal and pathological blood and urine. For students of medicine, nurses, and clinical technicians. Prerequisites, 111 and 131 or equivalent. One lecture and two laboratory periods. Three credits; spring. Boynton.

164. *Chemistry of Plant and Animal Tissues*.—Application of physiological chemistry to the study of biology. Prerequisite, Chem. 111 or 110 and 129. One lecture and two laboratory periods. Three credits; winter. Boynton.

165. *Chemistry of Nutrition*.—Enzyme and chemical reactions involved in digestion and metabolism. Prerequisite, Chem. 111 or 110 and 129. Two lectures and one laboratory period. Three credits; autumn. Boynton.

166. *Biochemical Preparations*.—Preparations of special substances involving biochemical methods. Two to three credits; autumn, winter, spring. Boynton.

171, 172. *Chemical Engineering*.—Basic operations common to chemical industries. Laboratory studies of typical apparatus. Three recitations and two laboratory periods. Prerequisite, Chem. 52, 123. Five credits; autumn, winter. Benson, Beuschlein.

173. *Chemical Engineering*.—Continuation of 172. Three drawing periods a week. No fee. Prerequisites, Chem. 52, 123. Three credits; spring. Benson, Beuschlein.

181-182. *Physical and Theoretical Chemistry*.—Fundamental theories of chemistry based on physical and chemical measurements. Three lectures and two laboratory periods a week. Prerequisite, Phys. 2 and Chem. 110. Five credits a quarter; autumn, winter. Tartar.

183. *Electro Chemistry*.—Theories and laws of voltaic currents and laboratory work with electro-chemical processes and measurements. Three lectures and two laboratory periods a week. Prerequisite, Chem. 182. Five credits; spring. Tartar.

190, 191. *History of Chemistry*.—Lectures and assigned readings. No fee. Prerequisite, Chem. 129, 182. Two credits; autumn, winter. Smith.

199. *Journal Seminar*.—Advanced students may register for assigned readings and reports on the chemical literature. Different members of the staff will have charge of the course during the various quarters. No fee. One credit; autumn, winter, spring. Powell.

COURSES FOR GRADUATES ONLY

*203. *Advanced Physical Chemistry*.

204. *Chemistry of Colloids*.—Fundamental properties of substances in the colloid state. Surface phenomena such as surface tension and absorption. Three lectures. Three credits; autumn. Tartar.

*205, 206, 207. *Inorganic Preparations*.

210, 211, 212. *Organic Preparations*.—Preparation of special substances involving representative laboratory methods. Any quarter may be taken independently. Credits and laboratory periods to be arranged. Autumn, winter, spring. Dehn.

*219. *Advanced Chemical Engineering*.

221, 222, 223. *Advanced Inorganic Chemistry*.—The periodic system of the elements. Two quarters devoted to the elements and their ordinary compounds, and one quarter to the chemistry of the higher order compounds. Recommended for all majors and graduate students. No fee. Three credits a quarter; autumn, winter, spring. Smith.

231, 232, 233. *Advanced Organic*.—Detailed study of special fields of organic chemistry. Any quarter may be taken independently. Prerequisite, Chem. 129 or equivalent. No fee. Three lectures. Three credits a quarter; autumn, winter, spring. Dehn.

250. *Research*.—The work in research is of three types: (1) Special investigations by advanced students under the direction of members of the staff; (2) Research for the master's degree. Maximum credit nine hours; (3) Research for the doctor's degree under direction of any member of the senior staff of the department. Maximum credit forty-five hours. Staff.

CIVIL ENGINEERING

Various Engineering Buildings and Laboratories

HYDRAULIC ENGINEERING

The hydraulic laboratory, located on the shore of Lake Union, offers the latest facilities for investigation of a large number of problems in experimental hydraulics and water power. A water surface of one acre in extent and 100 feet elevation above the laboratory floor, maintains a constant pressure for low and medium head experiments. For high head there is ample supply with pressure corresponding to 400 feet. In addition to the customary smaller apparatus the equipment includes a variety of pumps, motors, impulse wheels, and reaction turbines, aggregating approximately 350 H.P. capacity.

STRUCTURAL MATERIALS

The structural materials laboratory contains five Universal testing machines with capacities from 30,000 to 200,000 pounds, also two impact machines with hammers ranging in weight from 550 to 1,500 pounds. New equipment is being added so that the laboratory will remain entirely modern.

*Not offered in 1925-1926.

The cement laboratory has all facilities for tests of cement and concrete with special attention to equipment suitable for research work.

ROADS AND PAVEMENTS

The road laboratory is equipped for testing materials used in road construction. Standard machines adopted by the American Society for Testing Materials and by the U.S. Office of Public Roads are available.

SANITARY ENGINEERING

The department has access to a number of local water purification plants which are used as a basis for the study of sanitary problems. The departments of chemistry and bacteriology encourage cooperation in the investigation of various problems related to their specialty.

COURSES FOR UNDERGRADUATES AND GRADUATES

135. *Advanced Mechanics*.—General theories of flexure. Problems in intermediate structures. Three credits; spring. More.

143. *Hydraulic Engineering*.—Complete problems presenting hydraulic engineering. Prerequisite, C.E. 142. Three credits; winter. Harris.

145. *Hydraulic Machinery*.—Development and theory of water wheels and turbine pumps; design of a reaction turbine; hydrostatic machinery and dredging equipment. Prerequisite, C.E. 142. Three credits; spring. Harris.

147. *Hydraulic Power*.—Investigations for power development; generation of power; penstock and turbines; types of installations. Prerequisite, C.E. 142. Senior and graduate engineers. Five credits; autumn. Harris.

153. *Water Supply*.—Principal engineering operations necessary to secure suitable water supplies for cities, towns and industrial plants. Senior and graduate C.E. Prerequisite, C.E. 142. Three credits; spring. Allison.

154. *Sewerage and Drainage*.—Design and construction of sewerage and drainage systems for cities and towns. Senior and graduate C.E. Prerequisite, C.E. 142. Three credits; autumn. Allison.

155. *Water Supply Problems*.—Methods used in obtaining a suitable supply; purification of water. Senior and graduate C.E. and Ch.E. Prerequisite, C.E. 142. Three credits; winter. Allison.

157. *Irrigation Engineering*.—Investigation regarding duty of water and methods of obtaining it for irrigation purposes. Design and construction of irrigation works. Prerequisite, C.E. 142. Three credits; winter. Allison.

158. *Sewage Treatment*.—Supplementary to C.E. 154, especially relating to public health; sewage disposal; garbage collection and destruction. Senior and graduate C.E. and Ch.E. Three credits; spring. Allison.

160. *Building Construction*.—Building design and construction problems. Prerequisite, C.E. 134. Three credits; spring. More.

161. *Structural Design*.—Relation of theory of structure to engineering practice. Special application to roof and bridge trusses. Prerequisite, C.E. 134. Three credits; winter. More.

164. *Advanced Structural Design*.—Reinforced concrete, arches, statically indeterminate truss design. Prerequisite, C.E. 161. Five credits; spring. More.

167. *Materials of Construction*.—Properties of materials used in engineering construction, timber, concrete, steel, etc. Recitations and laboratory. Prerequisite, C.E. 93. Lab. fee, \$2. Five credits; autumn. Collier.

169. *Engineering Relations*.—Construction and operation of projects, and of the involved business relations. Prerequisite, senior standing. Five credits; spring.

192, 194, 196. *Research*.—Time to be arranged. Two to five credits; autumn, winter, spring. Harris.

COURSES FOR GRADUATES ONLY

210, 212, 214. *Research*.—For graduates. Time to be arranged. Two to five credits; autumn, winter, spring. Harris.

CLASSICAL LANGUAGES AND LITERATURE

Denny Hall

I. GREEK

101, 102, 103. *The Periclean Age*.—Greek civilization from the founding of the Delian confederacy to the death of Socrates. Readings, conferences and reports. Prerequisite, Greek 4-5 or equivalent. Three credits a quarter; autumn, winter, spring. Densmore.

*104, 105, 106. *Greek Poetry*.

151, 152, 153. *Plato*.—Intensive study of the Republic, the laws (in part) and some of the shorter dialogues. Prerequisite, Greek 101-102-103. Three to five credits a quarter; autumn, winter, spring. Densmore.

191, 192, 193. *Literary Criticism in Connection with Sophocles*.—For graduates and advanced undergraduates. Three to five credits; autumn, winter, spring. Densmore.

II. LATIN

106. *Syntax and Prose Composition*.—Prerequisite, Latin 50 or 60 or 70. Three credits; autumn. Clark.

*107. *The Age of Cicero*.

108. *Vergil's Aeneid*.—Books VII-XII. Prerequisite, Latin 50 or 60 or 70. Three credits; winter. Clark.

109. *Pliny's Letters and Tacitus, Germania*.—A reading course. Prerequisite, Latin 50 or 60 or 70. Three credits; spring. Clark.

*113. *Roman Home Life and Religion*.

151. *Cicero, Tusculan Disputations and Seneca, Moralia*.—Two to five credits; winter. Sidey.

152. *Quintilian, Book X and Horace, Ars Poetica*.—Two to five credits; spring. Sidey.

153. *Christian Latin*.—Selections from Minucius Felix, Augustine, Lactantius and other early Christian writers. Open to graduates and advanced undergraduates. Two to five credits; autumn. Sidey.

*154. *Latin Epistolary Literature*.

*Not offered in 1925-1926.

*155. *Cicero: De Oratore or Orator and Pro Plancio.*

185, 186. *Vulgar Latin.*—Vocabulary and syntax; relation to archaic Latin, literary Latin and the Romanic languages. Prerequisite, three years of college Latin or special permission. Two to five credits each quarter; autumn, winter. Thomson.

*190, 191, 192.—*Latin Satire.*

ECONOMICS AND BUSINESS ADMINISTRATION

Commerce Hall

The degree of master of business administration is a professional degree; and the greater part, if not all, of the courses taken in satisfaction of the requirements for it will be selected from those offered by the College of Business Administration. It is open to holders of the degree of bachelor of business administration, bachelor of arts, or bachelor of science from any recognized institution, providing their previous training includes certain fundamental courses. Among these are elements of economics, money and banking, business law, accounting and such training as is necessary for advanced work in the subjects in which students are to specialize. Deficiencies as to previous work may be made up in this University, but such courses will not be accredited as a part of the work for the master's degree.

The degrees of master of arts and doctor of philosophy with a major in economics, are not professional degrees. They are given under the general conditions as set forth on pages 10-13.

Facilities for graduate work are of three main types: advanced courses, the library, and direct contact with business.

The advanced courses are numbered over 100. When it seems advisable in the discretion of the instructor, graduate students may be required to do certain work in addition to that required of undergraduates. Special attention is called to the research courses numbered from 190 to 199. All graduate students are expected to take course 201.

Among the special library facilities is the Carleton Parker Memorial Collection of books and periodicals dealing with employment management and industrial management. The University library is a depository of the United States government.

From time to time the aid of the College in the solution of specific problems is asked by business and industrial concerns. Where suitable, these problems are made a part of the work of the graduate seminar or one of the research courses. Closer contact with certain kinds of business may be gained through apprenticeships established in connection with the College. The work is supervised by the College and is paid for by the employer. While the experience which such an apprenticeship gives is regarded by the College as of great value, the work carries no academic credit. The apprentice must therefore expect to spend more than one year in preparation for the master's degree.

The College of Business Administration is able to give part time employment to a number of graduate students. This includes office work, grading of papers in undergraduate courses, and occasional aid in research work. As in all other cases in which a student is devoting only a part of his time to academic work, the amount of such work he is permitted to carry may be so reduced that more than three quarters will be necessary to satisfy the requirements for the master's degree.

*Not given in 1925-1926.

COURSES FOR UNDERGRADUATES AND GRADUATES

104. *Economics of Transportation.*—Relation of transportation to industry and society; development and present status of American transportation systems; organization of the service; traffic associations; classification territories; routes; traffic agreements; rates and regulations. Fee, \$1. Five credits; autumn. Atkinson.

105. *Business Organization.*—Business corporations, associations, combinations; special reference to their functions, operation, advantages and disadvantages, relation to the anti-trust laws. Fee, \$1. Five credits; autumn. Leib.

107. *Traffic Management.*—A study of the traffic problems of American railroads, including classifications, the rate structures of the chief rate-making territories and such matters as import and export rates, re-consignment and diversion, demurrage and claims. Fee, \$1. Five credits; winter. Atkinson.

110. *Advanced Accounting.*—Valuation of balance sheet and revenue statement items; surplus and reserves; dividends; sinking funds; liquidation of partnerships and corporations; consolidated balance sheets; reports of trustees and receivers. Prerequisite, B.A. 64. Fee, \$1. Five credits; autumn, winter, spring. Burton.

111. *Advanced Accounting.*—Advanced partnership and corporation accounting; nature of profits; dividends; the legal status of same; statement of affairs; realization and liquidation accounts. Fee, \$1. Prerequisite, B.A. 110. Five credits; autumn, winter, spring. Cox.

112. *Advanced Accounting.*—Bond and stock issue problems; premiums and discounts on securities; funds and reserves; mergers and consolidations; graphs and comparative statements; estate accounting. Prerequisites, B.A. 110, 111. Fee, \$1. Five credits; autumn, winter, spring. Cox.

113. *Ports and Terminals.*—Factors of a well coordinated port; modern terminal facilities; representative river, lake and sea ports. Fee, \$1. Three credits; winter. Farwell.

115. *Business Correspondence.*—Business letters; analysis of principles; development of judgment on points of business policy. Prerequisites, English 1 and junior standing. Fee, \$1. Five credits; autumn, winter, spring. Burd.

116. *Business Report Writing.*—Methods of securing and arranging facts; effective use of charts and graphs; practical application in frequent writing, culminating in major report based on personal investigation. Prerequisites, English 1 and junior standing. Fee, \$1. Five credits; winter. Burd.

117. *Exporting and Importing.*—Technique of exporting and importing; analysis of markets; preparation of documents and calculation of values of staples and of manufactured products and the financing of shipments. Prerequisite, B.A. 7. Fee, \$1. Five credits; autumn. Atkinson.

119. *Water Transportation.*—Economics of shipping with particular reference to organization and management; ship building and operating costs; rate practice and control; pools, agreements, conferences; ocean routes; shipping subsidies, etc. Fee, \$1. Five credits; spring. Farwell.

121. *Corporation Finance.*—Financial problems connected with promotion of corporations, underwriting and sale of securities, management, expansion and reorganization of unsuccessful corporations. Prerequisites, B.A. 62, 63, 57. Fee, \$1. Five credits; autumn. Dakan.

122. *Principles of Investment*.—A study of the underlying principles of investment credit, and a description of the origin and purpose of the various credit instruments used; the selection of sound investments; the investment policy of individuals and institutions; care of investments; investment market and its relation to the money market. Prerequisite, B.A. 57. Fee, \$1. Five credits; winter. Dakan.

125. *Banking Practice*.—Methods and machinery of bank operations. Internal organization of the bank; relation of the different functions; accounting methods; finding costs for the bank; problems of bank administration. Prerequisites, B.A. 62, 63, 57. Fee, \$1. Five credits; winter. Dakan.

126. *Commercial Credits*.—Extension of credit; the credit department; sources of information; credit analysis; credit insurance; practical problems. Prerequisite, B.A. 57. Fee, \$1. Five credits; autumn. Dakan.

127. *Foreign Exchange and International Banking*.—Theory of international exchange; rates of exchange; financing imports and exports; specie movements; foreign money market factors; foreign banking by American institutions; financing foreign trade; present status of foreign exchange. Prerequisite, B.A. 57. Fee, \$1. Five credits; autumn. Preston.

130. *Industrial Analysis and Control*.—Using cost statistics and reports as material, will deal with the development of policies for greater efficiency in management. Systems of accounting statistics with emphasis on manufacturing, selling, general administration and financial expenses with their significant ratios considered. Fee, \$1. Five credits; autumn. McIntyre.

131. *Advanced Industrial Analysis and Control*.—Budgetary control of expenses; effects of legislation on costs; commonly accepted indices of labor efficiency. Following same method as the preceding course, the problems of manufacturing and production from the point of view of owners and executives. Fee, \$1. Five credits; winter. McIntyre.

134. *Market Organization*.—Survey of marketing processes and systems; purchasers' buying habits and producers' distribution channels; the middlemen and their functions; the retail outlets. Fee, \$1. Five credits; autumn. Russell.

135. *Marketing of Food Products*.—The economic and commercial problems involved in the distribution of foodstuffs from producer to consumer, both in raw material and as processed or manufactured commodities. Remedies of weaknesses in prevailing methods of marketing. Fee, \$1. Five credits; winter. Eldred.

136. *Market Analysis*.—Product analysis; price policies and sales strategy; sales promotion methods. Prerequisite, B.A. 134. Fee, \$1. Five credits; winter. Russell.

137. *Advertising Campaigns*.—Advertising appeals and their presentation; advertising media and their selection; appropriations; campaign plans. Prerequisite, B.A. 134. Fee, \$1. Five credits; spring. Russell.

*138. *Sales Management*.

139. *Social Insurance*.—A study of employers' liability and workmen's compensation legislation and practice in the United States and Europe; public health, old age and employment insurance. Prerequisite, junior standing. Fee, \$1. Five credits; spring. Smith.

140. *Cooperative Marketing*.—An examination of the more successful cooperative marketing ventures in the United States with a view to develop-

*Not offered in 1925-1926.

ing from their experience the principles upon which the cooperative marketing must be based. Prerequisite, B.A. 70, or equivalent. Fee, \$1. Five credits; spring. Eldred.

*141. *Fire Insurance.*

*142. *Life Insurance.*

143. *Trade of Far and Near East.*—Resources and trade of China, Japan, Siberia, the Philippines, French Indo-China; Siam, India, the Malay Peninsula, the Dutch East Indies, Australia, Persia, Mesopotamia, Syria, Arabia, Turkey and the Balkan States. Prerequisite, B.A. 7. Fee, \$1. Five credits; winter. Skinner.

144. *Trade of Europe.*—Resources of Europe and Africa, and the trade relations of these sections with the rest of the world, especially the United States. Prerequisite, B.A. 7. Fee, \$1. Five credits; winter. Atkinson.

145. *Trade of the Americas.*—Resources and trade of Mexico and the Central American and South American countries. Prerequisite, B.A. 7. Fee, \$1. Five credits; spring. Skinner.

146. *Retail Sales Problems.*—Fundamental principles underlying retail selling. Problems of stock display, personnel, and the consumer viewed from the point of the selling force. Fee, \$1. Five credits; autumn. Morse.

147. *Retail Buying Problems.*—Problems of the buyer in relation to the sales force, the consumer, the store policy, and net profit. Fee, \$1. Five credits; winter. Morse.

148. *Retail Store Organization Problems.*—Fundamental principles underlying departmentalization; and financial, personnel, and administrative organization. Fee, \$1. Five credits; spring. Morse.

149. *Marine Insurance.*—History, principles and practice of marine insurance as applied to ships, freight and cargo. Prerequisite B.A. 58. Fee, \$1. Five credits; winter. Smith.

150. *Railroad Finance and Administration.*—A study of the methods by which railroads are financed and administered; comparison with foreign systems; analysis of annual reports of leading systems; survey of railroad legislation. Prerequisites, B.A. 57, 62, 63, 104. Fee, \$1. Five credits; spring. Atkinson.

*151. *Rail and Marine Rates.*

152. *Shipping and Consular Regulations.*—Navigation laws relating to prevention of collisions at sea; inspection of vessels; employment of seamen; carrying of cargo and passengers; towage and pilotage; wharfage and moorage; liability of vessels and owner; duties of consular officials; administration of navigation laws. Fee, \$1. Three credits; spring. Farwell.

153. *Marketing of Lumber.*—Study of the inter-relations of manufacturers, wholesalers and retailers of lumber. Application of economic principles to effective methods of marketing lumber. Fee, \$1. Two credits; spring. Russell.

154. *Cost Accounting I.*—Organization of cost department; relation of cost to other departments; production factors; cost finding methods; material and labor records; preparation of operating statements. Prerequisites, B.A. 111, 112. Fee, \$1. Five credits; winter. McCahey.

*Not offered in 1925-1926.

155. *Cost Accounting II*.—Production and service departments; distribution of manufacturing expense; preparation of cost reports in planning and controlling production; standard costs, etc. Prerequisites, B.A. 111, 112. Fee, \$1. Five credits; spring. McConahey.

156. *Auditing*.—Auditing procedure; balance sheet audits; analysis of asset and liability values; profit and loss statement audits; analysis of income and expense; certifications and reports; classifications of audits and investigations. Prerequisites B.A. 111, 112. Fee, \$1. Five credits; autumn. McConahey.

157. *Income Tax Accounting*.—Government decisions affecting the practical determination of taxable income; persons, corporations, partnerships subject to tax; exemption and exception; deductions and allowances; preparation and analysis of returns. Prerequisites, B.A. 111, 112. Fee, \$1. Five credits; winter. McConahey.

158. *Managerial Accounting*.—Organization and duties of the accounting department in business from the standpoint of the management; the vital connection between management and accounts; how accounts should be handled to produce reports and statistics of the utmost value to the management. Prerequisites, B.A. 111 and 112. Fee, \$1. Five credits; autumn. McConahey.

159. *Advanced Money and Banking*.—Selected topics in monetary science and business finance; value of money; financial effects of the great war; the Federal Reserve system; agricultural credit; business cycles. Prerequisite B.A. 57. Fee, \$1. Five credits; spring. Preston.

160. *Advanced Economics*.—Theories of price determination and distribution, and a critique of the inter-reactions of political and economic principles. Fee, \$1. Five credits; autumn, winter, spring. Moriarty.

161. *American Labor Problems*.—Relation between the development of the American Labor Movement and free lands, immigration, economic organization, prices, industrial crises. Fee, \$1. Five credits; autumn. McMahon..

162. *European Labor Problems*.—Labor movements of modern Europe; economic and political backgrounds, in relation to types of labor organizations. Fee, \$1. Five credits; winter. McMahon.

163. *Industrial Management*.—Problems of promotion and location of industrial plants. Selection of site, layout of processes, and control of material. Types of buildings, lighting, safety appliances, economic and psychological effect of scientific management. Fee, \$1. Five credits; autumn. Leib.

164. *Land Economics*.—Brief review of the colonization and economic development of the United States, designed to bring out the chief factors involved in land settlement and land utilization. Some attention will be given to certain economic and business phases of contemporary American agriculture, marketing problems, reclamation and land settlement policies. Fee, \$1. Five credits; winter. Eldred.

165. *Labor Legislation*.—Development of the law, its interpretation in the solution of the American and European labor problems. Fee, \$1. Five credits; spring. Leib.

166. *Women in Industry*.—The evolution of women's work; relative importance of women in industry; social reaction in labor legislation. Fee, \$1. Five credits; spring. McMahon.

167. *Employment Management*.—Labor surveys, employment forms, job analysis and job specifications, time study, foreman training, wage determination, labor turnover, employees' associations and effective correlation of labor with manager and plant. Fee, \$1. Five credits; winter. Leib.

168. *History of Economic Thought*.—The chief contributors to economic theory from Adam Smith to Bohm-Bawerk as a basis for understanding present economic problems. Fee, \$1. Five credits; winter. Moriarty.

169. *Principles of Real Estate*.—The economic principles underlying the valuation of real estate, both urban and rural; relation of income and capital value; methods of appraisal; depreciation and obsolescence; leases; taxation and special assessments. Prerequisite, B.A. 164. Fee, \$1. Five credits; spring. Eldred.

*170. *Real Estate and Casualty Insurance*.

172. *Executive Technique*.—Internal organization of the business, departmental organization and coordination; various systems of management; use of reports and charts and consideration of problems presented by local industries. Fee, \$1. Five credits; spring. Leib.

173. *Commercial Policies*.—Commercial policies of the nations of the world in connection with the development of American foreign trade. Fee, \$1. Five credits; autumn. Skinner.

175. *Advanced Business Statistics*.—Collection, presentation and interpretation of statistical data relating to business operations, including consideration of business barometers, market analysis, sales and advertising. Prerequisite, Math. 13. Fee, \$1. Five credits; spring. Dakan.

176. *Investment Analysis*.—An analytical study of typical industrial, public utility and railroad securities. Analysis of financial operations, revenue and expense reports and their relation to investment values. The principles of valuation and rate structure of public utilities. Problems. Fee, \$1. Prerequisites, B.A. 64, 121, and 122. Five credits; spring. Dakan.

181-182-183. *Economics of Consumption*.—Historical development of human wants in relation to the economic laws of consumption; influence on the production and distribution of wealth. Attempts to control consumption through private and governmental agencies. Fee, \$1. Two credits; autumn, winter, spring. McMahon.

184. *Auditing Technique*.—Prerequisite, B.A. 111, 112. Fee, \$1. Five credits; autumn, winter, spring. Robertson.

185. *C.P.A. Problems*.—Selected problems covering various accounting principles. Work taken from American Institute and state C.P.A. examinations. Emphasis placed on speed, accuracy and forms of presentation. Prerequisite, B.A. 111, 112. Fee, \$1. Five credits; spring. McConahey.

188 *ABC. Apprenticeship in Merchandising*.—Students are placed full time in autumn and spring quarters in actual business. Four-six credits; autumn, winter, spring. Morse.

189. *Bank Credit Administration*.—A study of the administration of bank credit based on actual problems selected from portfolios of Pacific Northwest banks. Fee, \$1. Three credits; winter. Truax.

191 *ABC. Research in Accounting*.—Two-five credits; autumn, winter, spring. Davis.

195 AC. *Research in Foreign Trade and Transportation*.—Two-five credits; autumn, spring. Skinner, Atkinson.

196 BC. *Research in Management*.—Two-five credits; winter, spring. Leib, Gregory.

197 AB. *Research in Business Finance*.—197A, attention given to international financial reconstruction. 197B, attention to monetary and price theory. Two-five credits; autumn, winter. Preston.

198 AB. *Research in Marketing and Advertising*.—Two-five credits; autumn, winter. Russell.

COURSES FOR GRADUATES ONLY

201 ABC. *Graduate Seminar*.—Two-five credits; autumn, winter, spring. Lewis.

205 ABC. *Seminar in Value and Distribution*.—Two-five credits; autumn, winter, spring. Moriarty.

207 ABC. *Seminar in Labor*.—Two-five credits; autumn, winter, spring. McMahon.

EDUCATION

Education Hall

The department of education accepts candidates for the master's degrees and the degree of doctor of philosophy. The department is well equipped to guide research in the main fields of educational investigation. Especial opportunities are offered to direct research in educational psychology, educational tests and measurements, child study, adolescence, educational sociology, school surveys, administration of education, experimental education, comparative education, vocational guidance, and local history of education.

A well selected library of books and periodicals in English, French, and German has been assembled. Research involving other languages like Scandinavian, Spanish, and Italian may be pursued in connection with current problems in education by qualified students.

The public schools of Seattle and adjacent towns afford unexcelled laboratory facilities for various lines of modern research in education.

COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

To be admitted to courses in this group (II) students must have earned at least 10 credits in education, including courses 101, 110, or the equivalent. Normal school graduates are qualified to enter.

150. *Introduction to Educational Measurements*.—History and development of the use of tests and scales in education. Group intelligence tests, elementary statistical methods as applied to the handling of educational data, educational achievement or subject tests and scales. Lab. fee, \$2.50. Three credits; autumn, winter, spring or summer. (Two credits in Saturday section.) Dvorak.

151. *Educational Sociology*.—A systematic view of the larger relations underlying and surrounding the school, with the chief emphasis placed on generalization. Three credits, winter, spring or summer. Randolph.

152. *Social Surveys of School Studies and Activities*.—An attempt (a) to summarize the results to date of attempts by inductive methods to arrive

at socially valid materials for the school studies; and (b) to evaluate the theories involved. Two credits, winter, spring or summer. Randolph.

154. *Junior High School*.—History of the reorganization movement; functions and features of the new organization. Prerequisite, Educ. 119. Two credits, autumn. Roberts.

161. *History of Education*.—Social interpretation of the historic beginnings of education, contributions of the Greeks and Romans, development of Christianity, medievalism, and the beginning of modern education. Development of educational practices since the Renaissance. Five credits; winter. Randolph.

163. *History of American Education*.—Lectures, readings and investigations, focusing on the development of practices, theory, and instrumentalities rather than on the development of administrative organization. Five credits; spring. Randolph.

165. *Problem Children*.—Subnormal, superior, backward, eccentric, and delinquent children studied from the point of view of the teacher. Five credits; winter. Dvorak.

170. *Educational Psychology*.—Psychological basis of educational processes. Native endowment as the basis for learning; individual differences; habit formation; technique of learning, the learning curve, transfer of training; emotional and volitional behavior. Five credits a quarter; winter, spring. Bolton.

172. *Psychology of Elementary School Subjects*.—Survey of experimental studies which furnish the basis for approved practice in learning and teaching reading, writing, arithmetic, spelling, drawing, language, history, geography. Prerequisites, Educ. 101, 110, 119. Three credits; winter or summer. Williams.

173. *Psychology of High School Subjects*.—Consideration of experimental studies which form the basis for learning and teaching subjects in the high school curriculum; English, mathematics, science, history, and foreign languages. Prerequisites, Educ. 101, 110, 119. Three credits; spring. Williams.

174. *Psychological Problems of Vocational Education*.—Intelligence levels and vocational efficiency, acquisition of skills, vocational personnel, trade and vocational tests. Three credits; spring. Dvorak.

*176-177-178. *Educational Guidance*.

179. *The Health Education Movement*.—Its place in the elementary and secondary school program and in the community at large. The part of the school nurse, the physical education, home economics and classroom teachers in this work. Open to students majoring in any subject, who expect to teach in elementary or high schools. Three credits; winter.

Anderson, Soule, Kochne.

181. *Educational Problems of Adolescence*.—Physical, intellectual, emotional, moral and social characteristics of adolescents, and the educative activities suited to the period of secondary school education. Five credits; autumn. Bolton.

*186-187. *Elementary School Curriculum*.

191. *Educational Administration, State and County*.—Three credits; autumn. Ayer.

192-193. *Educational Administration: City School*.—For those preparing for superintendencies, principalships, and other supervisory positions. Three credits a quarter; winter and spring. Five credits in summer. Ayer.

195. *School Supervision*.—Analysis of the problems and technique of the improvement of school work through the in-service education of teachers. Five credits; spring. Randolph.

196-197-198. *Intelligence and its Measurement*.—The concept of intelligence with its practical bearing on school and social ability. Specialized training in the Stanford-Binet individual examination. For advanced students, teachers and principals. Lab. fee, \$4 for course. Two credits a quarter; autumn, winter, and spring. Dvorak.

COURSES FOR GRADUATES ONLY

To be admitted to courses in this group, students must be college graduates, and must have earned at least 18 credits or the equivalent in education. The following courses may be counted toward the masters' and doctors' degrees:

201. *Problems in Modern Methods*.—For advanced students. A critical evaluation of methods in examinations, grading, supervised study, the project, socialized recitation, problem method, assignment, laboratory procedure, etc. A seminar. Two credits; autumn and summer. Williams.

206. *Educational Statistics*.—Thorough course in the statistical treatment and interpretation of educational data. For advanced students, teachers and administrators. Three credits; autumn. Dvorak.

210. *Methods of Educational Research*.—Practices and methods in carrying out and writing up research problems. Required of all graduate students working on theses in education. One credit; autumn and summer. Dvorak.

212-213. *Comparative Education*.—Modern education in foreign countries, especially in Germany, France, England, Norway, Sweden and Canada. Relation between social ideals of nations and their educational systems. Post-war reorganizations. Influence upon educational theories and practices in America. Two credits a quarter; winter, spring. Bolton.

*232-233. *Advanced Educational Psychology*.

235. *Survey of Recent Educational Literature*.—For teachers and administrators in active service (1) who desire to investigate current educational problems, and (2) who desire to trace old educational interests through recent educational writings. Readings, discussions, reports based on reviews of new books and surveys of present unsolved and controversial problems in magazine literature. Two credits; winter. Roberts.

261*-262-263. *Seminar in Educational Sociology*.—Introductory summary of the tendencies and recent contributions of educational sociology, followed by practical work upon selected problems. Two credits a quarter; winter and spring. Randolph.

271-272-273. *Seminar in Educational Surveys*.—Two credits a quarter; autumn, winter, spring. Ayer.

275-276-277. *Seminar in Secondary Education*.—A study of curricula adjustments of the elementary school and the high school with special

*Not offered in 1925-1926.

attention to the junior high school. The relation of the high school to college and university, with emphasis upon the socialization of the high school curriculum. Studies in curricula reorganization. Two credits a quarter; autumn, winter, spring. Roberts.

285-286-287. *Seminar in Educational Measurements*.—Theory of educational measurements. Methods of test construction. Critical evaluation of new test material. Reports. For advanced students only. Lab. fee, \$2. Two credits a quarter; autumn, winter, and spring. Dvorak.

298-299-300. *Individual Research or Thesis Work*.—Original investigation of special problems. Results are usually reported in one of the seminars and when especially meritorious may be published. Special problems directed by members of the department. Three to five credits; autumn, winter, spring. Staff.

ELECTRICAL ENGINEERING

Engineering Hall

The department of electrical engineering offers excellent opportunities for the pursuit of graduate study. The work is of a two-fold nature:

(a) Study of advanced technical courses in electrical engineering subjects, and (b) research or experimental investigation of some approved engineering problem. To meet the requirements (a) a number of advanced courses are open to graduate students. The prerequisites for these courses are: one year of university physics, two years of mathematics including trigonometry, analytical geometry, differential and integral calculus and 32 hours of undergraduate work in electrical engineering (E.E. 109, 110, 111, 112, 161, 162, 163, 164). Facilities for research work are provided and in addition special apparatus for study of problems in electric, magnetic and dielectric circuits, high tension power transmission, electric transients, radio, etc.

Graduate students majoring in electrical engineering may work towards the degree of M.S. in Electrical Engineering, or the professional degree of E.E.

161. *Alternating Currents*.—Theory of singlephase and polyphase system; energy storage in magnetic and dielectric fields; vector diagrams and the symbolic methods of analysis; power factor and power measurements; hysteresis and eddy currents; theory of the transformer, singlephase and polyphase induction motors. To be taken with E.E. 162. Prerequisite, E.E. 111. Six credits; autumn, winter, spring. Loew.

162. *Alternating Currents Laboratory*.—Experimental work with alternating current machinery. To be taken with E.E. 161. Prerequisite, E.E. 112. Lab. fee, \$4. Four credits; autumn, winter, spring. Hoard, Smith.

163. *Alternating Currents*.—Theory of alternators, rotary converters, synchronous and commutator motors and transmission lines; high tension phenomena; corona; commercial wave forms; unbalanced and inter-linked systems. To be taken with E.E. 164. Prerequisite, E.E. 161. Six credits; autumn, winter, or spring. Loew, Hoard.

164. *Alternating Current Laboratory*.—To be taken with E.E. 163. Prerequisite, E.E. 162. Lab. fee, \$4. Four credits; autumn, winter, spring. Eastman, Shuck.

171. *Electric Railways*.—Equipment, roadbed, construction and operation. Prerequisite, E.E. 109, 110. Four credits; winter. Hoard.

173. *Central Stations*.—Location, design and operation of electric central stations. Prerequisite, E.E. 163, 164. Four credits; autumn, spring.

Kirsten.

175. *Power Transmission*.—Theory, design and operation of electric power transmission lines. Prerequisite, E.E. 163, 164. Four credits; autumn, spring.

Loew.

181. *Radio*.—Radio systems; lineal, open and complex oscillations; coupled circuits; resonance; transmitters; receivers; vacuum tubes in radio work; quenched and undamped oscillations. Prerequisites, E.E. 161, 162. Lab. fee, \$2. Five credits a quarter; winter or spring.

Loew.

186, 188. *Thesis*.—After consultation with the head of the department the student selects a suitable topic for investigation. Reports of progress are made weekly to the instructor in charge of the work selected. A complete report of the work is typewritten and bound and a copy deposited in the University library. Two to five credits a quarter; autumn, winter, spring.

Magnusson, Kirsten.

191. *Engineering Equations*.—Mathematical investigation of electrical phenomena with quantitative solutions of typical engineering problems. Prerequisite, E.E. 161, 162. Three credits; winter.

Loew.

190, 192, 194. *Seminar*.—Prerequisite, E.E. 163, 164. Four credits; autumn, winter, spring.

Magnusson.

195. *Electric Transients*.—Exponential law of simple transients; single and double energy transients; current oscillations and traveling waves; natural period of transmission lines; short circuits transients; surges; corona; lightning phenomena. Prerequisite, E.E. 163, 164. Two credits; autumn, winter, or spring.

Magnusson.

196. *Electric Transients Laboratory*.—To be taken in connection with E.E. 195. Prerequisite, E.E. 164. Lab. fee, \$2. Two credits; autumn, winter, or spring.

Smith.

198. *Electric Transients Laboratory*.—Continuation of E.E. 196. Lab. fee, \$2. Two credits; autumn, winter, or spring.

Smith.

COURSES FOR GRADUATES ONLY

210, 212, 214. *Research*.—Two to five credits a quarter; autumn, winter, spring.

Magnusson, Loew, Kirsten.

ENGLISH

Denny Hall

The equipment of the department of English for graduate work consists of the main library of the University, with virtually complete runs of all the philological journals and publications of learned societies, and the Joel M. Johanson Memorial Library. Through the courtesy of the librarian, it is possible for students engaged in special problems of research to borrow books from any of the large libraries in America and Canada. The Seattle Public Library is of course always available.

One Arthur A. Denny Fellowship of \$500 is open to graduate students in English who are residents of the State of Washington. There are several teaching fellowships and graduate scholarships.

All candidates for advanced degrees with a major in English must pass a preliminary examination in the general history of English literature. At the beginning of his residence the candidate shall report to the chairman of

the departmental committee on graduate studies, to arrange for this examination. (Candidates are exempt from this preliminary examination if they have within two years passed the senior examination given by the department.)

In addition to a ready command of Latin, French and German, candidates for the degree of doctor of philosophy must possess a thorough knowledge of Old and Middle English.

The department issues a leaflet of *Suggestions to Graduate Students* which may be obtained from the head of the department.

COURSES FOR UNDERGRADUATES AND GRADUATES

104. *Contemporary Literature: American*.—Special studies in contemporary American literature for advanced students. Three credits; autumn, winter, spring. Cox, Brown, Harrison.

105. *Contemporary Literature: Continental*.—Special studies in contemporary Continental literature for advanced students. Three credits; autumn, winter, spring. Harrison, Cox, Brown.

106. *Contemporary Literature: English*.—Special studies in contemporary English literature for advanced students. Three credits; autumn, winter, spring. Brown, Harrison, Cox

110, 111, 112. *Advanced Verse Writing*.—Given in conjunction with English 61, 62, 63. All the elementary credits must be earned before advanced credits will be given. Two credits; autumn, winter, spring.

Hughes.

*124, 125, 126. *The English Drama*.

*127, 128, 129. *Milton and His Contemporaries*.

130. *Mediaeval Literature: Survey*.—Old and Middle English classics studied in relation to the life and ideals of the Middle Ages. The epic, Caedmon, Cynewulf, King Alfred, The Pearl, Piers Plowman, Gower, Chaucer. Three credits; autumn. Griffith.

131. *Mediaeval Literature: Chaucer*.—The poetical works of Chaucer. Three credits; winter. Griffith.

132. *Mediaeval Literature: Romances*.—Mediaeval narrative literature, tales, lais, saint's legends, metrical romances. Three credits; spring. Griffith.

133, 134, 135. *Main Tendencies in English Literature, I*.—English national ideals from 1400 to 1700. The autumn quarter is devoted to the progress of the Renaissance in English literature and culture, the winter quarter to the Reformation in England, and the spring quarter to a consideration of Milton and Dryden. Three credits; autumn, winter, spring.

Benham.

136, 137, 138. *Main Tendencies in English Literature, II*.—English national ideals from 1700 to 1900. The fall quarter is devoted to eighteenth century prose and poetry, the winter quarter to nineteenth century prose, and the spring quarter to a consideration of Matthew Arnold and William Morris. Three credits; autumn, winter, spring. Parrington.

141, 142, 143. *Social Ideals in Literature*.—Model commonwealths, and such other literature as illustrates the development of social and economic thought. Three credits; autumn, winter, spring. Benham.

*144, 145, 146. *The Romantic Revolt*.

*Not offered in 1925-1926.

*147, 148, 149. *The English Novel.*

161, 162, 163. *History of American Culture.*—A consideration of American ideals and their expression in literature. The fall quarter is devoted to early New England, the winter quarter to the Knickerbocker School and the literature of the South, and the spring quarter to the New England Renaissance. Three credits; autumn, winter, spring. Parrington.

164, 165, 166. *American Literature since 1870.*—Autumn, the beginnings of realism; winter, tendencies from 1900 to 1915; spring, contemporary fiction and poetry. Three credits; autumn, winter, spring. Parrington.

*167, 168, 169. *Later American Poetry and Criticism.*

170, 171, 172. *Shakespeare.*—His work as a whole in the light of Elizabethan dramatic conditions. Three credits; autumn, winter, spring.

174, 175, 176. *Nineteenth Century English Poetry.*—Wordsworth, Shelley, Keats, Tennyson, Browning, Swinburne, Morris, Arnold, Rossetti. Three credits; autumn, winter, spring. Padelford.

*183, 184, 185. *General Literature.*

191, 192, 193. *Major Conference.*—Individual conferences to correlate studies and for guidance in individual reading. Each student is expected to meet his instructor once a week in conference. Three credits; autumn, winter, spring. Harrison, Cox.

*194, 195, 196. *Studies in Romance.*

197, 198, 199. *British Culture in the Nineteenth Century.*—Outstanding features of English life in the nineteenth century, as these are exhibited in literature and art. Three credits; autumn, winter, spring. Benham.

COURSES FOR GRADUATES ONLY

For other graduate courses that may be counted toward an English major for an advanced degree, see French 210, 211, 212, *French Criticism*; and Liberal Arts 214, 215, 216, *Studies in Realism*.

201, 202, 203. *Introduction to Graduate Study.*—Methodology and bibliography of the English language and literature. One credit; autumn, winter, spring. Benham.

204, 205, 206. *Pro-seminar in Chaucer.*—The works of Chaucer and the problems of Chaucerian scholarship. Two to eight credits; autumn, winter, spring. Griffiths.

*207, 208, 209. *English Literature from Chaucer to Dryden.*

211, 212, 213. *Seminar in 16th Century Literature.*—For the coming year the class will study the poetry of Edmund Spenser as a fusion of classical, mediaeval, and Renaissance impulses and traditions. Primarily for students who are in the second year of graduate study. Two to eight credits; autumn, winter, spring. Padelford.

224, 225, 226. *American Literature.*—Intensive study of early American literature. Two to eight credits; autumn, winter, spring. Parrington.

230, 231, 232. *Old and Middle English.*—Early English Grammar Readings in Old and Middle English authors. Three credits; autumn, winter, spring. Vickner.

*Not offered in 1925-1926.

250, 251, 252. *Thesis Research*.—Time and credit to be arranged. Autumn, winter, spring. Staff.

COMPARATIVE PHILOLOGY

The following courses in Comparative Philology are available in the department of Scandinavian Languages and Literature.

190, 191. *Introduction to the Science of Language*.—Two credits; autumn, winter. Vickner.

192. *Life of Words*.—Two credits; spring. Vickner.

FISHERIES

Fisheries Hall

The College of Fisheries is exceptionally well situated for graduate study. The University campus is on the shores of Lakes Washington and Union, which are connected with each other and with Puget Sound by canals. Extensive commercial fisheries for fishes, oysters, clams and crabs are conducted in Puget Sound, while fleets of vessels with headquarters at Seattle and other cities, carry on extensive fisheries in the ocean adjacent to the Washington coast, and on the fishing banks of Alaska. Numerous canneries, smokehouses, cold storage plants, fertilizer plants, are to be found in Seattle and other places on the Sound. A number of fish hatcheries are owned and operated in the state of Washington by the federal, state and county governments. At Friday Harbor the University owns and operates an excellent marine biological laboratory. These many advantages present unrivaled opportunities for study of fisheries, aquatic life and fish culture.

The degree of master of science (M.S.) in fisheries will be conferred on any graduate of the four-year curricula who has completed at least one year of graduate work and presented a satisfactory thesis with the grade of A or B. A graduate of any other institution of equal rank will be given full graduate standing, but he must have a satisfactory knowledge of zoology, chemistry, bacteriology, and botany. Selection of work for this degree must be approved by the director of the college. Before being recognized as a candidate for an advanced degree, a student must appear before a committee appointed by the dean of the Graduate School, who shall determine the student's fitness for such work and confer with him upon his proposed course of study.

FISHERIES LABORATORIES

Ichthyology Laboratory.—The ichthyology laboratory contains an extensive collection of named fishes, particularly rich in species from Puget Sound and Alaska. By exchange and other means a representative series of the fishes found in American waters, with particular reference to forms of economic importance, is being built up. There is a collection to illustrate the species of shellfish, crustaceans, and other invertebrate animals constituting the bases for the corresponding industries.

Fish Diseases Laboratory.—The laboratory for fish diseases is equipped for study of life histories of various parasites of aquatic animals, including aquaria for live subjects, and dark rooms for studying effects of various colored lights on the animals.

Fisheries Laboratory.—The apparatus laboratory is equipped with working models of the larger forms, fully rigged types of the smaller forms, of

fishery apparatus and detailed plans for their construction; equipment for manufacture, repair, care and preservation of nets; models of fishing vessels and boats, and samples of various fishery products prepared for market.

Canning Laboratory.—The canning laboratory is equipped with all machinery and appliances necessary for preparation and canning of all varieties of food products, in either glass or tin containers, including paring and slicing machinery, preparation table, exhaust box, closing machines and retorts. Here instruction is given in the usual commercial methods, while research is carried on in the development of new methods or the modification of the old to meet new conditions.

Curing and Drying Laboratory.—The curing laboratory contains the necessary equipment for making pickling solutions and brines, and for the drying, pickling, mild-curing and smoking of the various food products.

Fish Preservation Laboratories.—Ultimately a small refrigeration and cold storage plant will be installed for economic study of various methods of freezing and preserving food products in cold storage.

A smokehouse will be built for the purpose of carrying on experiments in smoking of various species and their utilization as food either in this condition or canned.

Testing Laboratory.—The testing room has a constant temperature of approximately 98° Fahrenheit, and in it samples of canned fishery products can be incubated, by means of which swells may be separated from the other cans and the sufficiency of the process used in the cannery determined. Various vacuum gauges and can testers are also available.

Research Laboratory.—The research laboratory contains the necessary chemical and bacteriological apparatus for investigation of problems of the food preserving industry. Laboratory desks are equipped with water, gas and electricity, and with balances, microscopes, apparatus for microphotography, pressure cookers and hand closing machines. The equipment includes sterilizers, incubator, vacuum drying ovens, hot-plates, and the necessary glassware.

AQUARIUM

The aquarium is equipped with a number of tanks for live fishes, and with balanced and other aquaria for study of aquarium management. Here students are taught to make accurate observations, record data, note habits, and to study reactions and the life histories of fishes.

FISH HATCHERY

The fish hatchery occupies about fourteen hundred square feet of floor space. It is furnished with hatching troughs, baskets, and other essential equipment for care of 2,000,000 salmon or trout eggs. A complete equipment consisting of batteries of open-top jars is provided for care of several million semi-buoyant eggs, such as those of the shad, whitefish and yellow perch. A tidal box is also available for handling eggs of saltwater species. Feeding tanks and aquaria are provided in which experimental work in fish culture may be carried on. A number of cement-lined ponds are available in the college grounds for rearing of various species of aquatic animals.

Within easy reach of the University are state and federal fish hatcheries where a study may be made of the actual conditions under which fish culture is carried on.

An arrangement has been effected with the U.S. Bureau of Fisheries under the terms of which the most promising seniors in fish culture will be afforded opportunity to spend five or six months at some one of the bureau's eighteen hatcheries in Washington, Oregon, and Alaska, half of this period to be during the summer vacation. They will be given opportunity to familiarize themselves with building and repair of hatcheries, setting fish traps, stripping spawning fish, and fertilizing and care of eggs until the young are hatched out. While so engaged, students will be paid wages current for this class of work. At the expiration of this period the students will return to the University to complete their course. After passing the regular civil service examination, as many of these students as there is room for will be appointed to the position of fish culturist.

COMMERCIAL OPERATIONS

In or near Seattle and available for study are plants for the canning of fish, crabs, shrimps and clams; the mild-curing of salmon; the pickling of salmon, herring, and sablefish, the freezing and cold storage of fish and oysters; the dehydration of fish; the smoking of fish, and the preparation of oil, fish meal and fertilizer from the waste. Two large can-making establishments, several plants manufacturing canning machinery, and a number of others supplying various machines and supplies for the industry, also are located in Seattle. Such of these industries as are not in Seattle are conveniently situated nearby, and the transportation costs to them are low.

Shellfish Culture.—On Puget Sound and in Hood Canal are numerous private oyster beds where cultivation has been practiced for some years. The state owns certain oyster reserves which are utilized for experimental purposes. These are all within reasonable distance of Seattle and are available for study purposes by the students of the college.

Fishery Operations.—Trap netting, purse and haul seining, gill netting, trolling, hand and long-line fishing, oyster gathering, clam digging, kelp harvesting, and other forms of commercial fishing are carried on either in the harbor of Seattle, or waters adjacent, during the proper seasons, and can be observed and studied on the ground.

FIELD EXCURSIONS

Much of the instruction in fish culture and fisheries technology is given in the field, necessitating frequent excursions to nearby hatcheries, fishing camps, oyster beds, and industrial plants. The varied fishery apparatus owned by the college is used in nearby waters. The expense of such excursions will be comparatively small.

SUMMER WORK

Students of fisheries and food preservation are advised to spend their summer vacations in some line of practical work connected with the fishery and food preservation industries. As the college is convenient to the more important fish, fruit and vegetable canneries and dehydrating plants, ample opportunity is afforded for summer employment. Students not only acquire valuable experience in this way, but earn a considerable portion of their university expenses.

115. *The Economic Fishery Resources of North America.*—Fishery resources of the North American continent and adjacent seas, their development and commerce, and government policies of conservation. Three credits; spring. Cobb.

147. *Preparation of Secondary Products.*—Manufacture of fish meal, fertilizer, oils, glues, leathers and furs from aquatic animals. Prerequisite, Fish. 107 and 108. Three lectures and demonstrations. Three credits; autumn. Nightingale.

150, 151, 152.—*Problems in Fish or Shellfish Culture and Fisheries Technology.*—Students with proper preparation, which should include 15 hours in fish culture, or 15 hours in shellfish culture and Fish. 55, or 15 hours in fishery methods and preparation of fishery products, will be assigned special problems to be worked out under the direction of the instructor. Lab. fee to be arranged. Five credits a quarter; autumn, winter, spring. Cobb and staff.

154. *Diseases of Fish.*—Nature and causes of disease in fish. Three lectures and two laboratory periods. Lab. fee, \$4. Five credits; autumn. Guberlet.

175. *Exploration of the Sea and its Relation to Economic Food Fishes.*—The influence of various factors in the conditions of life of economic food fishes in the sea. Three credits; spring. Nightingale.

190. *Fishways and Fish Stops.*—The design, construction and uses of fishways and fish-stops. Two lectures and one laboratory period. Three credits; autumn. Cobb.

195, 196. *Seminar.*—Assigned readings and reports in current periodical literature. Bibliographical work, discussions and symposiums on subjects of general interest to advanced students in fisheries. Prerequisite, senior or graduate standing in fisheries. Two credits; autumn, spring. Cobb.

COURSES FOR GRADUATES

201, 202, 203. *Research Problems.*—Investigation of assigned problems. Open to qualified graduates after consultation. Credits and time to be arranged. Autumn, winter, spring. Cobb and staff.

FORESTRY AND LUMBERING

Anderson Hall

The College of Forestry is unusually well equipped for graduate work. Situated in the center of the largest lumber producing region of the world, and in the heart of the national forests of the Northwest, the advantage of the location should prove particularly attractive to graduate students for advanced studies and research in silviculture, forest management, lumbering and all the branches of forest utilization.

Graduate Work.—Two advanced degrees are offered to students who have received the bachelor's degree at this University or other institutions of equal rank, and have a satisfactory knowledge of the fundamental sciences. The candidate for the degree of master of forestry (M.F.) must earn 225 credits at this University, of which at least 78 are in approved technical forestry subjects. The candidate for the degree of master of science in forestry (M.S.F.) must present a minor in one or two subjects in the College of Science. In addition to these requirements the candidate for either degree must present a thesis embodying results of independent research and pass an oral examination open to all members of the faculty.

A graduate from a college of forestry of equal rank with the College of Forestry of this University may complete the requirements for the advanced degree in one year. Graduates from other institutions of equal rank which give no courses in technical forestry may complete the required work in two years, providing they have training in the fundamental sciences, mathematics and surveying.

FORESTRY AND LUMBERING LABORATORIES

Dendrology.—Individual lockers. Extensive collection of tree seeds, cones, bark specimens. An arboretum is under way.

Logging and Lumbering.—Field work at logging camps and sawmills about Seattle. Complete equipment of instruments and tools is available for work in logging engineering. Collections of lumber, showing grades and patterns, charts of lumber grades, exhibits of sawmill and wood saws, logging equipment, such as wire ropes, axes, hooks, blocks, special appliances for donkey engines, saw-mill belts and models of high lead logging.

Mensuration.—Equipment selected to show principal types of instruments in use. Those adapted for use in the Northwest are provided in quantities sufficient for all practice work in cruising, surveying, volume, growth and yield studies.

Silviculture.—Forests around Seattle offer wide opportunities for practical studies and demonstrations. The extensive forest tree nursery of the College of Forestry affords excellent opportunity for practice in modern nursery methods.

Timber Physics.—Laboratory work is conducted in the U.S. Forest Service Timber Testing Laboratory, operated in cooperation with the University. The laboratory is magnificently equipped with seven large testing machines for static and impact loading, circular and band saws, planer and other shop equipment for wood-working.

Wood Technology.—Individual lockers, gas, water, compound microscopes and all apparatus for preparing and sectioning wood for microscopic study are provided. Hand specimens and planks of domestic and foreign commercial timbers are provided in large quantities. These include extensive collections of South American, Australian, Philippine, Japanese and other foreign hardwoods. Microscopic slides of nearly all American woods are kept on hand for check specimens.

Forest Products Laboratories.—The Forest Products Laboratory was erected at a cost of \$85,000. Owing to the shortage of class room accommodations on the campus the Forest Products Laboratory has been used to house all the activities of the College of Forestry until March, 1925. The completion of Anderson Hall, erected at a cost of over \$250,000 by Mrs. Agnes H. Anderson in memory of her husband, the late Alfred H. Anderson, now makes the entire space in the laboratory building available for research.

The laboratories for work in forest products now ready on the campus consist of five distinct units, as follows:

1. General Laboratory.—Equipped with special wood sectioning and plain sliding microtomes, binocular research microscope with mechanical stage and microscopes of usual pattern, special illuminating devices for microscopic studies, micro-projection apparatus, water-baths, large and small gas and electric drying ovens, platform scales, analytical and pulp balances, all apparatus necessary for the technical examination of wood preservatives, standardized thermometers, enlarging and reducing camera, standard horizontal photo-micrographic apparatus, dark room, and all incidental apparatus required in the detailed study of woody tissues.

2. Wood Preservation Laboratory.—A 14-inch by 12-foot retort, equipped with vapor drum and condenser, air compressor, vacuum pump and duplex pressure pump, is arranged for experimental work

with any pressure process of treating wood. An open-tank plant of semi-commercial size is available for treatment of 9-foot material. It consists of one treating tank, two steel storage tanks for creosote and a wooden tank for the storage of metallic-salt solutions.

3. Wood Distillation Laboratory.—A retort of about one-half cord capacity is equipped with copper condensers, gas pump, gas tank and redistilling apparatus. This plant has been installed by the U.S. Forest Service for cooperative work with the University.

4. Dry Kiln Laboratory.—A dry kiln with a capacity of 10,000 feet B.M., equipped with a temperature controller, air compressor, hygrodisk, recording hygrometer and a recording thermometer is conveniently located on the University spur of the Northern Pacific Railway.

5. Pulp and Paper Laboratory.—A 100-pound capacity digester and a beating engine of equivalent capacity are provided for research in the pulping of wood. These will be installed in the near future.

Commercial Plants.—Plants for manufacture of paper, wood pipe, cooperage, excelsior, wood conduit, veneers, furniture, boxes, and numerous other secondary wood products are available for study. Four large creosoting plants and several smaller preservative plants are also available.

Demonstration Forest and Experiment Station.—This consists of a 60,000 acre tract comprising the Pilchuck-Sultan watersheds, formerly a part of Snoqualmie Forest. It is very conveniently reached from Seattle, and offers almost ideal conditions for a school forest. It has a stand of timber of over a billion and a half feet. Nearly all species of the Pacific Northwest are represented, but more than three-fourths is composed of Douglas fir, cedar and hemlock. As there is an excellent representation of age classes, the tract lends itself readily to scientific forest management. It is estimated that the tract will yield about \$75,000 annually on a sustained yield basis. It is expected that title to the tract will be completed this year.

COURSES FOR UNDERGRADUATES AND GRADUATES

183. *Milling.*—The sawmill; yard arrangements; practical operation, practical problems at local sawmills. For seniors and graduates. Prerequisites, M.E. 82, For. 104, 153, 158. Five credits; autumn. Grondal.

184. *Manufacturing Problems.*—Technical trade requirements, routine of sawmill practice; relation of waste to marketing, lumber grades and their uses. Prerequisite, For. 183. Three credits; winter. Grondal.

185-186-187. *Logging Engineering.*—Logging machinery and equipment, organization of logging companies, construction of railroads, camps, etc. Lectures, demonstrations at plants manufacturing logging machinery, and field work in nearby logging camps. During the third quarter all the work is transferred to the field, where extensive work in logging engineering is conducted. No credit is given for 186 unless followed by 187. Primarily for seniors and graduates. Prerequisites, For. 52, 53, 58, 104, 153, M.E. 82, C.E. 22. Lab. fee for 187, \$3. Four credits a quarter, autumn and winter. sixteen credits; spring. Clark.

188, 189. *Advanced Forest Products.*—Advanced studies in wood technology and utilization, with individual problems. A laboratory course. Prerequisite, For. 101, 158. Lab. fee, \$3. Five credits; spring, winter. Grondal.

COURSES FOR GRADUATES ONLY

201. *Forest Geography.*—Advanced dendrology. Silvicultural regions,

their relation to regional industrial development and general problems of lumbering and management. Three credits; autumn. Winkenwerder.

202. *Thesis*.—Autumn, winter, or spring; three to six credits. Grondal.

208, 209. *Seminar*.—Reviews, assigned readings, reports, and discussions on current periodical literature and the more recent Forest Service publications. Two credits a quarter; autumn, winter. Kirkland, Winkenwerder.

213, 214, 215. *Research*.—Credits to be arranged; any quarter. Instructors assigned according to nature of work. Lab. fee, \$3. Staff.

221. *Forest History and Policy*.—Forest policy of the United States; forestry in the states and island possessions; the rise of forestry abroad. Three credits; autumn. Kirkland.

223. *Advanced Forest Management*.—About one week of field work on a tract of 50,000 to 100,000 acres. Formation of a working plan for regulation of the yield and organization of all forest work on the area, with estimates of outlay and income. The basic field data are supplied. Eight credits; spring. Kirkland.

224. *Advanced Milling and Marketing*.—Sawmill design and a detailed study of special problems in sawmill operation and management. Five credits; spring. Grondal.

GEOLOGY

Science Hall

The major portion of the area tributary to the University is a virgin field for study in geology. There is a great opportunity for the graduate student along the lines of petrography, paleontology, and economic geology. The investigations thus far made have tended only to disclose the extraordinary extent of the unknown fields. In paleontology the tertiary formations alone have yielded more than 125 new species of invertebrates, and only a few localities have been studied in detail. Field work can be carried on in close conjunction with residence study by taking advantage of week-ends, vacation periods and the summer months.

COURSES FOR UNDERGRADUATES AND GRADUATES

111. *Climatology*.—Broader aspects of climate controls and characteristics of different climates and climatic provinces, with special references to United States and the Pacific Coast. Prerequisite, Geol. 10 or 11 or equivalent work. Three credits; spring. Saunders.

†112. *Physiography of the United States*.—Physiographic regions of the United States and their effects on development and history of the country. With or without laboratory work. Prerequisite, Geol. 10 or 1. Lab. fee, \$1. Three or five credits; autumn. Saunders.

113. *Physiography of Europe*.—Physiographic regions of Europe and effects of topography and climate on development and relations of different countries. Lectures and map study. Prerequisite, Geol. 10 or 1. Three credits; winter. Saunders.

121. *Advanced Mineralogy*.—Opaque, metalliferous minerals studied with the reflecting microscope, or "mineragraphy"; relation of the latter to geologic, mining and metallurgical problems. Prerequisite, Geol. 123. Three credits; autumn. Goodspeed.

†May be taken without laboratory for three credits

122. *Field Methods*.—Principles and methods of geologic surveying and mapping. Detailed field work in small areas, with field trips. Prerequisite, Geol. 1, 2, 21, and 120. Two credits; spring. Goodspeed.

124. *Petrography*.—Principles of petrography and petrographic methods in the systematic study of igneous, sedimentary and metamorphic rocks. Prerequisite, Geol. 123. Lab. fee, \$2. Four credits; winter. Goodspeed.

125. *Advanced Petrography*.—Continuation of the work in petrography for majors in mining and geology. Prerequisite, Geol. 124. Two credits with additional credits optional; spring. Goodspeed.

126. *Economic Geology*.—Economic deposits of the principal non-metallic minerals, their production and uses. Lectures and discussions of papers. Prerequisites, Geol. 1 and 21. Three credits; autumn. Landes.

127. *Economic Geology*.—Economic deposits of the chief metallic minerals, their production and uses. Lectures and discussion of papers. Prerequisites, Geol. 1, 21 and 124. Five credits; winter. Landes.

128. *Economic Geology*.—Petroleum fields of the world. Lectures and discussion of papers. Prerequisites, Geol. 1 and 2. Three credits; spring. Landes.

129. *Economic Geology*.—Minor or less known metallic minerals used in the arts and industries. Prerequisite, Geol. 127. Three credits; autumn. Landes.

130. *Economic Geology*.—Minor or less known non-metallic minerals of commercial importance. Prerequisite, Geol. 126. Three credits; winter. Landes.

131. *General Paleontology*.—Principles of paleontology and a general systematic study of fossils. Prerequisite, Geol. 2. Lab. fee, \$2. Five credits; winter. Weaver.

132. *Invertebrate Paleontology*.—Systematic study of fossil and living representatives of the Mollusca. Prerequisite, Geol. 131. Lab. fee, \$2. Five credits; spring. Weaver.

140. *Structural and Stratigraphic Geology*.—Certain structural and stratigraphic features, and their practical applications. Prerequisites, Geol. 2, 120, and 122. Three credits; autumn. Weaver.

COURSES FOR GRADUATES ONLY

200. Field studies or advanced work in general geology. Credits and hours to be arranged. Each quarter. Staff.

210. Advanced or research work in geography, climatology or physiography. Credits and hours to be arranged. Each quarter. Saunders.

220. Advanced or research work in mineralogy, petrography and metamorphism. Credits and hours to be arranged. Each quarter. Goodspeed.

225. Advanced or research work in economic geology. Credits and hours to be arranged. Each quarter. Weaver.

230. Advanced or research work in paleontology and stratigraphy. Credits and hours to be arranged. Each quarter. Weaver.

GERMANIC LANGUAGES AND LITERATURE

Denny Hall

The graduate courses in this department have been planned with a two-fold purpose: to give that broad acquaintance with German life and literature which must form the background for any specialized effort, and to offer the student the opportunity of acquainting himself with the latest results of critical scholarship in Germanics and of training himself in independent research.

For these purposes in certain definite fields the library facilities are adequate. The literature of the classic period and the post-classic nineteenth century is represented for the most part in the best scientific editions and many of the leading periodicals and publications of literary societies are at hand in complete sets. In the field of philology the library facilities are ably supplemented by those of the Scandinavian department.

104. *Recent Writers*.—The best prose and dramatic literature adapted to rapid reading and representative of German middle class and industrial life. Written and oral reports. Prerequisite, Ger. 6 or 12 or three years of high school German. Three credits; autumn. Eckelman.

106, 107, 108. *German Literature in Translation*.—Goethe, the lyric poet. The novel and the drama of the nineteenth century. Reading and discussion of the most significant works. Written reports. No knowledge of German required. Three credits, autumn; two credits, winter and spring. Eckelman.

*110. *Advanced Prose Composition and Conversation*.

115, 116. *Upper Division Scientific German*.—Scientific essays, monographs, technical periodicals. Each student does private reading in his own field under guidance of the instructor and major professor. Conferences. Prerequisite, courses 5 and 10, or 5 and 60, or 6, or three years in high school. Two or three credits a quarter; winter, spring. Eckelman.

*118-119-120. *German Prose Reading*.

*121. *Phonetics*.

*130-131-132. *German Institutions*.

*133-134-135. *Modern Novels*.

*136. *Modern Drama*.

140. *Studies in German Literature*.—From the best prose and dramatic works after Schiller's time. An introduction to literary movements. Class reading and assigned topics. Prerequisite, Ger. 100 or equivalent. Three credits; exceptional students may earn six credits; spring. Eckelman.

*142. *Lyrics and Ballads*.

*151. *Lessing*.

*152, 153. *Goethe's Lyrics and Dramatic Works*.

186, 187, 188. *Nineteenth Century Literature*.—The drama and novel to 1880. Kleist, Grillparzer, Hebbel, Ludwig, Raabe, Keller, Storm, C. F. Meyer. Primarily for graduates. Three credits; exceptional students may earn six credits; autumn, winter, spring. Eckelman.

*200-201-202. *Goethe's Lyrics and Letters*.

*Not offered in 1925-1926.

- *203-204-205. *Storm and Stress Period.*
- *206-207-208. *Romantic School.*
- *220-221-222. *Inter-relations of German and English Literature.*
- *250-251-252. *History of the German Language.*
- *253. *Middle High German.*
- *256-257-258. *Gothic.*
- *259. *Old Saxon.*

HISTORY

Denny Hall and Philosophy Hall

At the time of his first registration the student should consult the departmental pamphlet on advanced degrees in history, which may be obtained from the dean of the Graduate School and from the head of the department of history. It contains information and suggestions which supplement those given below.

DEPARTMENTAL REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS

1. *Preliminary Requirements.*—Major work in history in the University of Washington, or its equivalent. One modern foreign language is desirable for work in the European field.

2. *Substantive Requirements.*—One year's work, including a major in history and one or two minors in related subjects. The major normally shall consist of a thesis of four to nine hours, together with courses of study bringing the total to at least thirty-three hours. The minor shall total normally twelve hours. It is considered advisable that the candidate should take the course in methods of historical research and criticism (History 201-202-203), and that he should work in two of the following fields: ancient history; European, including English history; American. One course should be a seminar or research course in the field of the thesis subject.

3. *Final Examination.*—This shall embrace

- a. Courses for which graduate credit has been obtained.
- b. The general field in which the thesis lies; that is, the equivalent of a survey course in ancient history, or medieval history or modern continental European history or English history or American history.
- c. The bibliography—historical literature—of the general field above, together with sources and literature of the specific field of the thesis subject.

DEPARTMENTAL REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

1. *Requirements for a minor in history when the degree is obtained in another department.*

1. The amount of work in the department of history in residential courses shall usually total a minimum equivalent to seven hours for one year (or twenty-one quarter hours), and these courses must be of upper division grade.

2. The final examination shall be based upon

*Not offered in 1925-1926.

a. The substance of the survey course which covers the general field in which the bulk of the minor lies. Such general fields are ancient history, medieval history, modern European history, English history, American history.

b. Substance of specific courses taken—of which one at least must be a seminar. (It is contemplated by the department that this examination, so based, shall deal rather with the subject than with the specific content of the courses as given in class.)

c. Reasonable knowledge of the general literature of the subjects authorized.

II. Requirements for the degree when the major is history.

1. *Preliminary Requirements.*—No work shall be counted toward the attainment of the degree until the prospective candidate shall have fulfilled the department's requirements for an undergraduate major in history, viz., from 36 to 60 credits within the department, including normally a survey course in medieval and modern European history, or its equivalent, and including at least eighteen credits in the most advanced undergraduate courses.

Importance is attached to equipment in foreign language. Evidence of a reading knowledge of the basic language required by the probable thesis-field shall be submitted to the department within six months after the application for candidacy; and the remainder of the requirements of the Graduate School in this respect shall be satisfied on or before the end of the first six months of the second year of graduate work. The facile use of both Latin and Greek is required of all who take the degree in ancient history.

2. *Substantive Requirements.*—The major shall include the entire field of history, Oriental excepted, unless it constitutes the candidate's special field, and the candidate is required to pursue in residence courses in both European and American history. The course in methods of historical research and criticism (History 201-202-203) should be taken in the first year of residence, unless this requirement shall have been satisfied elsewhere.

The minors shall be chosen from fields of study logically related to historical pursuits and to the candidate's special field of work: such as political science, economics, anthropology, sociology, English literature, French, German, Latin, Greek, philosophy.

COURSES FOR UNDERGRADUATES AND GRADUATES

71-72-73. *Ancient History.*—History of the ancient world to the times of Augustus. By special work under direction of the instructor upper division students may receive upper division credit. Three credits a quarter; autumn, winter, spring. Larsen.

81-82-83. *England Since the Accession of George I.*—Construction of the British commonwealth, Imperial problems, internal economic and institutional developments, especially the growth of democracy. Prerequisite, Hist. 1-2 or 5-6. By special work under direction of the instructor upper division students may receive upper division credit. Two credits a quarter; autumn, winter, spring. Quainton.

85-86. *Medieval Civilization.*—Main cultural features of the period from St. Augustine to Dante—thought, politics, art, literature, commerce and industry. By special work under direction of the instructor upper division students may receive upper division credit. Prerequisite, Hist. 1-2 or 5-6. Five credits a quarter; autumn, winter. Lucas.

101. *Alexander the Great: his Empire and his Successors.*—Three credits; autumn. Larsen.

**102. The Greek Federal Leagues: Their History and Institutions.*

103-104. *The Roman Empire from Augustus to Justinian.*—Three credits a quarter; winter, spring. Larsen.

105-106-107. *English Constitutional History.*—Development of legal and governmental institutions of the English people to the present time. Valuable for students of political science and law as well as history. Graduate students who have had no English political history are advised to take History 108-109-110 along with this course. Three credits a quarter; autumn, winter, spring. Richardson.

108-109-110. *English Political History, Pre-law.*—Open only to graduate students, pre-law sophomores, and majors in political science and history who are taking Hist. 105-106-107. Two credits a quarter; autumn, winter, spring. Richardson, Buchanan.

**111. Greek Political Institutions.*

114. *Renaissance and Reformation.*—Prerequisite, 1-2 or 5-6. Five credits; spring. Lucas.

**117. France from the Reformation to the French Revolution.*

**121-122-123. Prussia and Northern Europe in the 17th and 18th Centuries.*

125. *Turkey and the Near East, 1453-1924.*—Deals with the Near Eastern question; the rise, expansion and decline of the Ottoman Empire; and the awakening and modern development of the Balkan nations. Prerequisite, Hist. 1-2, or 131. Five credits; spring. Quainton.

129. *The French Revolution and Napoleonic Era.*—Prerequisite, Hist. 1-2. Five credits; autumn. Quainton.

130. *Europe, 1814-1870.*—Prerequisite, Hist. 1-2. Five credits; winter. Quainton.

131. *Europe Since 1870: The War and its Background.*—Historical background, fundamental causes and progressive development of events and issues in the world war. Five credits; spring. Richardson.

**139. The Southern Colonies.*

**140. The New England Colonies.*

**141. American Revolution.*

143. *History of United States, 1789-1815.*—Three credits; autumn.

McMahon.

144. *History of United States, 1815-1846.*—Three credits; winter.

McMahon.

145. *History of United States, 1846-1860.*—Three credits; spring.

McMahon.

147. *History of the Civil War Period.*—Three credits; autumn.

McMahon.

148. *History of the Reconstruction Period.*—Three credits; winter.

McMahon.

149. *History of National Development.*—Development of the American nation from the close of the reconstruction period to the present time. Five credits; spring. McMahon.

153. *The Pacific Rim*.—History of the countries bordering upon the Pacific Ocean with especial reference to recent changes. Three credits; autumn. Meany.

154. *Spain in America*.—Rise and fall of Spanish power in America. and an outline of the history of the Spanish-American republics. Three credits; winter. Meany.

155. *History of Canada*.—Canadian development to the present time. Three credits; spring. Meany.

157-158-159. *History of American Diplomacy*.—American relations with foreign powers from colonial times to the present. Two credits a quarter; autumn, winter, spring. Meany.

163-164-165. *Northwestern History*.—From the earliest voyage to the Pacific Northwest to the organization of the present form of government. Two credits a quarter; autumn, winter, spring. Meany.

COURSES FOR GRADUATES ONLY

201-202-203. *Methods of Historical Research and Criticism*.—The sessions of this class will frequently exceed one hour. One credit a quarter; autumn, winter, spring. Richardson.

*204-205-206. *Historiography*.

207-208-209. *Problems and Sources of Greek and Roman History*.—Two to five credits a quarter; autumn, winter, spring. Larsen.

211-212-213. *Research in European History (1300-1600)*.—Two to five credits a quarter; autumn, winter, spring. Lucas.

215-216-217. *Seminar in English History*.—Two credits a quarter; autumn, winter, spring. Richardson.

221-222-223. *Seminar in American History*.—Two credits a quarter; autumn, winter, spring. McMahon.

227-228-229. *Seminar in State History*.—Two credits a quarter; autumn, winter, spring. Meany.

HOME ECONOMICS

Home Economics Hall

The aim in graduate work in home economics is two-fold. First, to meet the need of those who desire further subject matter or a perfecting of technical skill greater than their undergraduate work afforded. Second, to train intensively in methods of research along the lines of textiles, food economics, nutrition, institutional management and home economics education. The former is for immediate practical application in a chosen profession and does not necessarily lead to a master of arts or master of science degree. The latter is distinctly graduate in character and is accepted for the master's degree.

Equipment.—The equipment of the department is ample for problems of research. The textile laboratory is well equipped in chemical and microscopical apparatus, as well as helpful illustrative material. The foods laboratories, of which there are three in addition to a small kitchen, have a large

*Not offered in 1925-1926.

supply of varieties of stoves using all types of fuel for experimental purposes in addition to full general equipment. Nutrition problems are carried on in the laboratory arranged for that work alone. A rat colony furnishes teaching material and opportunity for research problems.

Cooperating Agencies.—Cooperation of institutions of the city affords valuable opportunities to extend research work beyond the limits of the University class rooms, and association with the managers and buyers in department stores, the richest of fields for textile research. Seattle has all types of commercial and philanthropic institutions involved in studies of food economics, and liberal use of such sources is made by graduate problems of food supply and consumption.

Through cooperation with public health nurses associations and social service agencies it is possible to collect data and to test the application of principles of nutrition in homes and institutions. In institutional management, a particular point of strength lies in an availability of all types of institutions for first hand study.

Supporting Courses.—Knowledge of supporting subjects, chemistry, physics, physiology, bacteriology, economics, fine arts, is essential for all advanced work. Additional courses in these may be selected on the advice of the major professor and the dean of the Graduate School.

COURSES FOR UNDERGRADUATES AND GRADUATES

130, 131. Clothing: Commercial Clothing Construction.—Laboratory practice on a commercial basis. Study of trade conditions. Prerequisites, H.E. 113, P.S.D. 9 and 169. Five 2-hour periods, recitation and laboratory work. Lab. fee, \$3. Three credits a quarter; winter and spring. Patty.

133. Clothing: Costume Design.—Development of fashion from ancient times to the present with emphasis upon the best art periods. Adaptation to the present mode. Prerequisites, H.E. 113, P.S.D. 169. Three 2-hour periods, two lectures. Lab. fee, \$3. Five credits; spring. Patty.

135. Millinery.—Design, selection, practice in construction, trade methods and materials. Prerequisites, H.E. 8 or equivalent, P.S.D. 9. Three 2-hour laboratory periods, recitation and laboratory work. Lab. fee, \$3. Three credits; spring. Patty.

188. Advanced Textiles.—Historic art fabrics. Intensive study of a modern fabric. Methods of commercial testing. Prerequisites, H.E. 25, Econ. 1. Two 2-hour periods, recitation and laboratory work. Lab. fee, \$3. Two credits; spring. Denny.

190. Nutrition: Nutrition of Children.—Work centers around the University Cooperative Child Nutrition Service. Consultation with physicians and instructor, follow-up case work in homes of the children and visits to institutions for child care. Prerequisites, H.E. 105 or 107. Two hours recitation, three hours laboratory period, three hours field work. Open to graduate and advanced undergraduate students. Lab. fee, \$2. Four credits; autumn, winter, spring. Koehne.

191. Nutrition: Dietotherapy.—Considerations of particular dietary needs of the sick and convalescent. Relation of certain disorders to nutrition. The function of nutrition as a curative and preventive factor in disease. Prerequisite, H.E. 107. Open to graduates and advanced undergraduates. Three lectures and recitations, one laboratory period. Visits to hospitals. Lab. fee, \$4. Four to five credits; spring. Koehne.

COURSES FOR GRADUATES ONLY

**200. Special Food Problems.—Research.*

202. *Seminar.*—The present status of home economics education with special reference to the work in the State of Washington. Prerequisites, 30 credits in home economics. Credits to be arranged; autumn, winter. Raitt.

**203. Research.*

204, 205, 206. *Research in Nutrition.*—Animal experimentation on some special problem. Open to graduate students. Prerequisites, H.E. 107-108, Chemistry and physiology majors may take this course with consent of instructor. Hours and credits to be arranged. Lab. fee, \$2 per hour credit; autumn, winter, spring. Koehne.

207, 208, 209. *Research in Textiles.*—Prerequisites, H.E. 25, Econ. 1. Credit to be arranged. Lab. fee, \$1 per credit hour; autumn, winter, spring. Denny.

210, 211, 212. *Research in Costume Design.*—Prerequisites, H.E. 112-113, 133. Credit to be arranged; autumn, winter, spring. Patty.

JOURNALISM

Commerce Hall

Advanced courses in journalism, history, economics, political science, sociology, and English are offered students wishing to take graduate study in preparation for newspaper work or teaching journalism. A wide demand exists in high schools, colleges, and universities for instructors adequately trained to teach journalism. The University library contains a large collection of bound newspapers and magazines and furnishes unusual opportunity for a historical study of American journalism. Special provision is made for directing the work of graduate students interested in historical, political, psychological, or language studies in journalism. The courses required will be determined by the nature and amount of undergraduate work the candidate has done in journalism and the phase of it in which he wishes to specialize, such as advertising, the business office, trade journalism, or the purely editorial field. A thesis constitutes one of the requirements. On completion of the required number of hours, the degree of master of arts in journalism is granted by the University.

COURSES FOR UNDERGRADUATES AND GRADUATES

104. *Newspaper Administration.*—Newspaper organization and management. Prerequisite, Jour. 51. Two credits; spring. Spencer.

**105. The Sporting Page.*

109. *Literary and Dramatic Reviewing.*—Routine work of literary and dramatic editors. Prerequisite, Jour. 51. Two credits; winter. Borah.

115. *Elements of Publishing.*—Head styles; proof-reading; binding; engraving; press work; problems of production. Required of journalism majors. Lab. fee, \$2. Three credits; autumn. Kennedy.

120. *Copy Reading.*—Required of majors in journalism. Prerequisite, Journ. 101. Lab. fee, \$2. Five credits; winter, spring. Spencer, Borah.

128. *Work of the Foreign Correspondent.*—Prerequisite, Jour. 101. Lab. fee, \$1. Three credits; winter. Hall.

*Not offered in 1925-1926.

130. *Fundamentals of Advertising*.—Lab. fee, \$2. Five credits; autumn. Jones.
131. *Display Advertising*.—Prerequisite, Jour. 130. Lab. fee, \$2. Five credits; winter. Jones.
133. *Advertising Typography*.—Type families; application of type; advertising type units; type problems. Prerequisite, Jour. 115. Lab. fee, \$2. Five credits; spring. Kennedy.
136. *Comparative Journalism*.—Prerequisite, Jour. 51. Lab. fee, \$2. Three credits; autumn. Hall.
138. *History of American Journalism*.—Required of majors in journalism. Prerequisite, Jour. 51. Lab. fee, \$2. Five credits; spring. Jones.
150. *Editorial Writing*.—Required of majors in journalism. Prerequisite, Jour. 101 and 120. Five credits; autumn. Jones.
- 170, 171, 172. *Magazine and Feature Writing*.—Practice in writing special newspaper and magazine articles; study of current magazines and newspaper supplements. Articles are graded, according to their probable marketability. Lab. fee, \$2 a quarter. Two credits a quarter; autumn, winter, spring. Spencer.
173. *The Short Story*.—Critical appreciation of the short story. Lab. fee, \$2. Three credits; autumn. Spencer.
- 174, 175. *Short Story Writing*.—Prerequisite, Jour. 173. Lab. fee, \$2 a quarter. Three credits a quarter; winter, spring. Spencer.

COURSES FOR GRADUATES ONLY

250. *Research in Journalism*.—Admission only by consent of the instructor. Three to five credits; autumn, winter, spring. Spencer.

LAW

Commerce Hall

FIRST YEAR

All first year courses required.

100. *Agency*.—Wambaugh's Cases, 2nd Ed. Five credits; spring. Ayer.
- 103-104. *Contracts*.—Corbin's Cases. Five credits per quarter; autumn and winter. Lantz.
- 106-107. *Criminal Law and Procedure*.—Derby's Cases, 2nd Ed., supplemented by Washington Criminal Code and Cases. Three credits per quarter; autumn and winter. O'Bryan.
- 108-109. *Pleading and Procedure*.—Keigwin's Cases on Common Law Pleading, and Sunderland's Cases on Code Pleading, and Washington Code and Cases. Five credits per quarter; winter and spring. Goodner.
115. *Property I.—Personal*.—Bigelow's Cases, Vol. I. Three credits; autumn. Bissett.
116. *Property II.—Real*.—Bigelow's Cases, Vol. II. Five credits; spring. Bissett.
- 117-118. *Torts*.—Ames' and Smith's Cases, Pound's Ed. Four and two credits respectively; autumn and winter quarters. Ayer.

SECOND YEAR

125-126. *Equity*.—Case book to be selected. Three credits per quarter; autumn and winter. Ayer.

128. *Damages*.—Beale's Cases on Damages, supplemented by Washington Cases. Three credits; spring. O'Bryan.

129-130. *Evidence*.—Wigmore's Cases. Five and four credits, respectively; autumn and winter. Condon.

133. *Insurance*.—Vance's Cases. Three credits; spring. Lantz.

137. *Negotiable Instruments*.—Huffcut's Cases. Three credits; winter. Bissett.

138. *Quasi-Contracts*.—Woodruff's Cases. Three credits; spring. Lantz.

139-140. *Property III*.—Aigler's Cases, Vol. III. Autumn and winter quarters, four and two credits, respectively. Bissett.

142-143. *Public Utilities*.—Beale and Wyman's Cases. Three credits per quarter; winter and spring. Lantz.

146-147. *Sales*.—Woodward's Cases, 2nd Ed. Three credits per quarter; winter and spring. Ayer.

161. *Procedure IV*.—Procedure in civil actions in the Superior Court of Washington. Five hours. Three credits; autumn. Goodner.

179. *Partnership*.—Gilmore's Cases, supplemented by Washington Cases. Three credits; spring. O'Bryan.

THIRD YEAR

153. *Property IV*.—Kale's Cases, Vol. IV. Three credits; autumn. Bissett.

159. *Wills*.—Costigan's Cases. Three credits; autumn. Goodner.

163. *Procedure VI*.—Probate Proceedings, covering administration of estates, probate of wills, appointment of guardians, etc. Five hours. Four credits; winter. Goodner.

165. *Admiralty*.—Ames' Cases. Three credits; autumn. Lantz.

166. *Office Practice*.—Conveyancing and examination of abstracts, care of a law office generally, drawing wills and contracts, preparation of briefs and office accounts. Five credits; spring. Condon.

168. *Conflict of Laws*.—Lorenzen's Cases, 2nd Ed. Five credits; winter. Lantz.

170-171. *Constitutional Law*.—Hall's Cases. Three credits per quarter; autumn, winter. Bissett.

187-188. *Private Corporations*.—Canfield and Wormser's Cases. Three credits per quarter; autumn and winter. Goodner.

191. *Property V*.—*Community*.—Washington Statutes and selected cases on community property. Five credits; spring. Bissett.

196. *Trusts*.—Kenneson's Cases. Five credits; spring. Goodner.

200. *Evidence*.—Research course. Prerequisite, Law 129-130. Credits 2-5; autumn, winter, spring. Condon.

LIBERAL ARTS

Denny Hall

214, 215, 216. *Studies in Realism, Literary and Philosophical*.—An attempt to develop from current theories a constructive view. Two to eight credits a quarter; autumn, winter, spring. Cory.

MATHEMATICS

Philosophy Hall

The department of mathematics will undertake to direct the research work of students who hope to earn the doctor's degree through work done in some branch of pure mathematics. For this end the University now offers adequate opportunities. The mathematics department library contains complete sets of the more important mathematical journals and the collected works of many of the great mathematicians of all ages. There is a well-equipped mathematical model and instrument room. The department library is accessible to graduate students at all times with liberal loaning privileges to the more advanced students. The Mathematics Research and Journal Club where the original contributions to mathematics by members of the University faculty are first presented, is open to graduate students and invites their active participation.

COURSES FOR UNDERGRADUATES AND GRADUATES

101. *Spherical Trigonometry*.—Prerequisite, Math. 2 and 4. Two credits; autumn. Moritz.

102, 103. *Solid Analytical Geometry*.—Prerequisite, Math. 108 or 63. Two credits a quarter; winter, spring. Moritz.

107, 108, 109. *Calculus*.—Elements of differential and integral calculus, primarily for students in the College of Science. Prerequisite, Math. 6. Five credits a quarter; autumn, winter, spring. Moritz.

114, 115. *Ordinary and Partial Differential Equations*.—With applications to problems in physics, chemistry, astronomy and engineering. Prerequisite, Math. 108 or 63. Three credits a quarter; autumn, winter. Carpenter.

117, 118, 119. *Projective Geometry*.—Classical theory through Pascal and Brianchon. Selected topics in involution, binary forms, algebraic invariants, the conic as a rational curve and a ternary form. To meet needs of teachers and professional mathematicians. Prerequisite, calculus, unless it is taken concurrently. Two credits a quarter; autumn, winter, spring. Winger.

151. *Mathematical Theory of Finance*.—Prerequisite, Math. 109 or 63. Three credits; autumn. Moritz.

152. *Mortality Tables*.—Prerequisite, Math. 109 or 63. Three credits; winter. Moritz.

153. *Insurance—Premiums and Reserves*.—Prerequisite, Math. 109 or 63. Three credits; spring. Moritz.

*161, 162, 163. *Analytical Mechanics*.

164, 165, 166. *Mathematic Physics*.—For students of science, aiming to give the student sufficient mathematics to enable him to read the easier scientific papers in the current literature. It presupposes a thorough grasp

*Not offered in 1925-1926.

of elementary physics and mathematics through the calculus. Differential equations should be taken before or concurrently. Three credits a quarter; autumn, winter, spring. Neikirk.

COURSES FOR GRADUATES ONLY

201, 202*, 203*. *Differential Geometry*.—Prerequisite, Math. 109, 115, 119. Three credits; autumn quarter only. Carpenter.

*204, 205, 206. *Modern Algebra*.

*207-208-209. *Theory of Relativity*.

*211, 212, 213. *Foundations of Mathematics*.

*214, 215, 216. *Modern Analysis*.

*217, 218, 219. *Elliptic and Theta Functions*.

*221, 222, 223. *Higher Plane Curves*.

*224, 225, 226. *Real Variables*.

227*, 228, 229. *Theory of Numbers*.—Prerequisite, Math. 109 or 63. Two credits a quarter; winter and spring only. Bell.

*231, 232, 233. *Theory of Infinite Processes*.

*251, 252, 253. *Mathematical Journal and Research Club*.

MECHANICAL ENGINEERING

Engineering Hall

Steam engineering, gas engines, and machine design offer attractive opportunities for advanced work in this department.

The steam engineering laboratory has been enlarged and is well equipped with experimental machinery. Investigations of fuels, oils, and refrigeration may be undertaken. The installation of a semi-Diesel engine and Sprague dynamo-meter facilitate research work with reference to internal combustion engines. Power plants of all types are located in the vicinity of the University and are available for study and tests.

The engineering library contains texts, papers and journals covering mechanical engineering subjects.

COURSES FOR UNDERGRADUATES AND GRADUATES

151, 152, 153. *Experimental Engineering*.—Continuation of M.E. 83, involving more extended and complete investigations. Prerequisite, M.E. 83. Lab. fee, \$2. Three credits a quarter; autumn, winter, spring. Wilson, Winslow.

167. *Engineering Materials*.—Properties of various materials used in engineering construction, including iron, steel, reinforced concrete and timber. Recitation and laboratory. Prerequisite, C.E. 132. Junior mechanical and electrical engineers. Lab. fee, \$2. Three credits; autumn, winter and spring. Wilslow, McMinn.

179. *Steam Turbines*.—Theory, construction and design of steam turbines. Prerequisite, M.E. 82. Three credits; spring. Eastwood.

182. *Heating and Ventilation*.—Various systems of heating and ventilating methods, designs and tests. Prerequisite, M.E. 82. Three credits; autumn, winter. Eastwood.

183. *Thermodynamics and Refrigeration*.—Fundamental principles underlying the transformation of heat into work, with special application to engineering. Prerequisite, M.E. 82. Five credits; autumn, winter.

Eastwood.

184. *Power Plants*.—Design of steam power plants, involving their location, buildings, prime movers, and power transmission. Prerequisite, M.E. 123, 83. Three credits; spring.

Winslow.

198. *Gas Engineering*.—Development of gas engineering; stationary, marine, automobile and airplane motors, and gas producer plants. Prerequisite, M.E. 82. Three credits; autumn, winter, spring.

Wilson.

199. *Gas Engine Design*.—Calculations and plans for the design of a given type of motor. Prerequisite, M.E. 198. Three credits; spring.

Wilson.

COURSES FOR GRADUATES ONLY

211-212-213. *Research*.—Autumn, winter, spring. Three credits a quarter.

Eastwood.

MINING, METALLURGY AND CERAMICS

Mines Laboratory

The department of mining, metallurgy, and ceramics offers graduate courses leading to the master's degree or to a professional degree. In addition, certain courses in this department may be used as the minor for a degree in other departments. The location of the University is favorable for the pursuit of advanced study in these fields owing to the varied natural resources found and the important commercial operations taking place in the Northwest. The equipment available for the use of graduate students is extensive.

The United States Bureau of Mines maintains at the College of Mines its Northwest Experiment Station, which serves the Pacific Northwest and the coast regions of Alaska. The headquarters of the station, from which all operations in this territory are directed, are in the Bureau of Mines building, opposite Bagley Hall. This building contains offices, library, analytical and fuels laboratories, while the coal washing, ceramics and other equipment used by the bureau in cooperation with the college is housed in Mines Laboratory. At present the principal investigations being conducted by the station are in the treatment and uses of coal and in ceramics. Members of the experiment station staff give occasional lectures to the students of the University on their special subjects.

Since the destruction of Mines Hall by fire on December 16, 1924, the College of Mines makes its headquarters in the building called Mines Laboratory, of which five-ninths was erected in 1921. This building is located in the engineering group and is the latest representative of the collegiate gothic style of architecture adopted by the University. The structure is four stories in height, with steel frame and reinforced concrete walls and floors. At present all the work in mining, coal washing, metallurgy, and ceramics is housed in this building. When the remaining four-ninths of the structure is completed, the classrooms, offices, collections, and metallography room will be separated from the laboratories with heavy equipment, such as those for mining, ore dressing, coal washing and clay preparation. The departmental library consists of 630 bound volumes besides several thousand state, federal, and other publications.

The degree of engineer of mines (E.M.) is given to graduates in mining engineering who have practiced their profession for at least three years and who present a satisfactory thesis. Graduates in metallurgy may receive

the degree of metallurgical engineer (Met.E.) under similar conditions, and the appropriate advanced degrees are open to graduates of the other curricula.

Fellowships.—Several fellowships in mining, metallurgy, and ceramics are open to graduate students. The Arthur A. Denny fellowship, valued at \$500, is open to deserving students who are residents of the State of Washington. Applications for this fellowship should reach the Dean of the College of Mines by March 15 and should be accompanied by a statement of the candidate's record and three letters from instructors or employers regarding his professional ability.

Five fellowships described in the following paragraphs are open for work under the joint direction of the College of Mines and the United States Bureau of Mines.

Graduates from suitable technical courses at institutions of recognized standing, or men who present evidence of technical training which has fitted them to undertake investigations, are eligible to enroll in mining and metallurgical research. The degree of master of science may be granted to those students who, holding a suitable bachelor of science degree, complete investigative work in compliance with the University requirements for the master's degree. Although as much latitude as possible will be allowed in the choice of subjects for research, the general topics will be those which are of special importance to this region.

Research Fellowships.—In connection with the department, five research fellowships of \$720 annual value (net to the holder) have been established. These fellowships are open to qualified graduates of scientific or technical courses in institutions of recognized standing. Each applicant should send a copy of his record from the registrar's office of the college where he has been, or will be, graduated, and the names and addresses of at least three references, who know his character, training, and ability. Applications for these fellowships are due not later than April 20, and should be addressed to the Dean, College of Mines, Seattle, Washington.

Appointees to the fellowships report for duty on July 1, and are required to be on duty during the entire year, except that in case of reappointment for a second year, the fellowship holder is given a vacation from June 15 to July 1.

Fellowship holders are required to register as graduate students in the University of Washington and to become candidates for the degree of master of science in mining engineering, metallurgy or ceramics, unless an equivalent degree has previously been earned.

Investigations of Problems.—The University will, under certain conditions, permit mining and metallurgical companies who have special problems for solution, to detail a representative to work on such problems, or to meet the expense of engaging a man to do so. Experiments which can be carried on as readily in commercial laboratories and which do not require direction from the Bureau's experts are not undertaken. The research work shall be under the direction of the department, and complete records of all the data obtained in the investigation of the problems shall be filed with the department, which shall have the right to publish this information for the benefit of the mining and metallurgical industry.

COURSES FOR UNDERGRADUATES AND GRADUATES

I. MINING

106. *Mining Excursion.*—A five days' trip, taken in the spring of the junior year to a neighboring mining region; detailed examinations of mining and metallurgical industries. Expense is approximately \$25. One credit; spring. Roberts, Daniels.

107. *Mining Excursion*.—A five days' trip, taken in the spring of the senior year, similar to Min. 106. One credit; spring. Roberts, Daniels.

122. *Coal Mining Methods*.—Prospecting and development. Detailed study is made of a nearby mine. Prerequisite, Min. 51. Three recitations. Three credits; winter. Daniels.

151. *Mining Engineering*.—Lectures on exploration, mine development, power generation, air compression, hoisting and transportation. Practice with air compressors, machine drills, and mine equipment in laboratories and local plants. Prerequisite, senior standing. Two recitations, one laboratory period. Lab. fee, \$5. Three credits; autumn. Roberts.

152. *Ore Dressing*.—Certain branches of ore dressing, mill tests of ores checked by assays. Prerequisite, senior standing. Three recitations and two laboratory periods. Laboratory fee, \$10. Five credits; spring. Roberts, Daniels.

162. *Cost of Mining*.—Mining methods and costs. Prerequisite, senior mining standing. Three recitations. Three credits; winter. Roberts.

**163. *Mine Operation*.—Complete operations at typical mines, including mining, transportation and treatment of ore, disposal of products, company finances, and management. Illustrated by ores and products, maps and photographs, and other materials. Prerequisite, senior standing. Three recitations. Three credits; spring. Roberts.

170. *Coal Mining Machinery*.—Coal cutting machines, mine locomotives, fans, hoists, and pumps with especial reference to application to coal mining. Prerequisite, senior standing. Three recitations. Three credits; autumn. Daniels.

171. *Mine Gases and Ventilation*.—Composition and properties of mine gases, methods of testing; lighting of mines; principles of ventilation; ventilating machinery. Prerequisite, Min. 122. Three recitations. Three credits; winter. Daniels.

176. *Coal Preparation*.—Methods of preparing coal for market, together with laboratory tests and runs on various coals, to determine best methods of preparation. Prerequisite, Min. 101, Met. 103. Two recitations and three laboratory periods. Lab. fee, \$10. Five credits; winter. Daniels.

178. *Coal Preparation Machinery*.—Machines and equipment used in tipples and washeries for the screening and washing of coal. Prerequisite, Min. 176. Two recitations. Two credits; spring. Daniels.

182. *Mine Management*.—Organization and administration of engineering plants, the keeping and interpretation of cost accounts, the efficiency of labor and methods, the financial, legal and social aspects of engineering operation. Prerequisite, senior standing. Three recitations. Three credits; spring. Daniels.

191, 192, 193. *Thesis*.—Preparation of a graduation thesis in mining, metallurgy or ceramics. A fee of \$5 a quarter is required to cover cost of materials. Completed thesis must be submitted at least one month before graduation. Prerequisite, senior standing. Hours and credits to be arranged. Roberts, Daniels, Corey, Wilson.

**Will be offered if a sufficient number of students elect the course.

COURSES FOR GRADUATES ONLY

201, 202, 203. *Seminar*.—Lectures and discussions by Bureau of Mines staff, College of Mines faculty and fellows. Required of Bureau of Mines fellowship holders. Prerequisite, graduate standing. One credit; autumn, winter, spring. Roberts, Daniels, Corey.

211, 212, 213. *Graduate Thesis*.—Preparation of a thesis in mining, metallurgy, or ceramics. Prerequisite, graduate standing. A fee will be required if the work involves the use of laboratory materials or equipment. Hours and credits to be arranged. Roberts, Corey, Daniels, Wilson.

221, 222, 223. *Graduate Metal Mining*.—Studies in metal mining or in ore dressing. Prerequisite, graduate standing. Hours and credits to be arranged. Roberts.

251, 252, 253. *Graduate Coal Mining*.—Studies in coal mining or in the preparation of uses of coal. Prerequisite, graduate standing. Hours and credits to be arranged. Daniels.

II. METALLURGY

155. *Iron and Steel*.—Metallurgy and manufacture of commercial iron and steel; especial reference to their properties and uses in engineering work. Prerequisite, junior standing. Three recitations. Three credits; autumn. Daniels.

160. *Metallurgical Analysis*.—Technical methods of analysis of slags and industrial products. Prerequisite, Met. 153. Two laboratory periods. Lab. fee, \$12. Two credits; spring. Corey.

162. *Metallography*.—Constitution and microstructure of metals and alloys, especially iron and steel. Prerequisite, senior standing. Two recitations. Two credits; autumn. Corey.

163. *Metallography*.—Preparation and study of metal sections, photomicrography and the use of the microscope in testing industrial alloys. One recitation and two laboratory periods. Lab. fee, \$5. Three credits; winter. Corey.

165. *Metallurgy Calculations*.—Physical chemistry of the metallurgists, slag calculations, etc., illustrated by figures quoted from the present practice at a number of smelting plants. Prerequisite, senior standing. Three recitations. Three credits; winter. Corey.

166. *Electrometallurgy*.—Study of methods and practice with special consideration of the possibilities of electrometallurgical industries in the Pacific Northwest. Prerequisite, senior or graduate standing. Three credits; spring. Corey.

COURSES FOR GRADUATES ONLY

221, 222, 223. *Graduate Metallurgy*.—Studies in metallurgy. Prerequisite, graduate standing. Hours and credits to be arranged. Corey.

III. CERAMICS

**140. *Pottery*.—Occurrence, winning and preparation of materials used in pottery manufacture. Processes used in moulding, drying, firing, glazing, and decorating of pottery. Two lectures and recitations. Two credits; autumn. Wilson.

**Will be offered if a sufficient number of students elect the course.

****150. Lime, Plasters and Cements.**—Raw materials, manufacture and testing of lime, calcined gypsum, sand-lime brick, and Portland cement. Prerequisite, Chem. 3. Three lectures and recitations. Three credits; winter. Wilson.

****160. Glass Technology.**—Theory and factory practice of glass manufacture. Prerequisite, Cer. 105. Two lectures and recitations. Two credits; autumn. Wilson.

****170. Metal Enamels.**—Theory and practice of metal enameling. Prerequisite, Cer. 105. Two lectures and recitations. Two credits; autumn. Wilson.

180. Refractories.—Origin, occurrence and physical properties of fire-clays and other refractory materials. The manufacturing problems of fire-clay, silica, magnesia, chromite brick, electric furnace products and special refractories. Prerequisite, junior standing. Two recitations and one laboratory period. Lab fee, \$5. Three credits; winter.

COURSES FOR GRADUATES ONLY

221, 222, 223. Graduate Ceramics.—Studies of the ceramic resources of the Pacific Northwest, or in the manufacture of clay products. Prerequisite, graduate standing. Hours and credits to be arranged. Wilson

MINING AND METALLURGICAL RESEARCH

The Technical Staff of the United States Bureau of Mines Northwest Experiment Station in Co-operation with the Instructors in the College of Mines.

Class work is directed by members of the instructional staff of the University. Research work is under joint direction of the United States Bureau of Mines and the College of Mines. Subjects of research relate to the mining and metallurgical industries of the state and adjacent regions.

During the coming year investigations are contemplated in the following subjects:

1. The preparation and utilization of coal.
2. Ceramics.
3. Electrometallurgy.

ORIENTAL LIFE, HISTORY, LANGUAGES AND LITERATURE

Philosophy Hall

The work offered for advanced undergraduates and graduate students falls under the following heads:

1. *Oriental.*—Under this head advanced work is offered in the political history, religions, philosophies and literatures of China and Japan.

2. *Indo-European.*—The Sanscrit language (vedic and classical) is offered, with particular reference to the comparative philology of the Indo-European tongues. Also the study of the religions, philosophies and literatures of India and Persia from the earliest times to the present day.

3. *Semitic.*—Courses are offered in elementary and advanced Hebrew, with a critical study of the Old Testament Scriptures. Also there is offered a study of the religion, literature, and archaeology of the Euphrates Valley, from the earliest Sumerian times to the break-up of the Neo-Babylonian Empire. Elementary Arabic is also offered together with a critical study of the Quran, the religious system of Muhammad, and the political history of the Khalifate down to modern times.

**Will be offered if a sufficient number of students elect the course.

101-102-103. *Hebrew, Aramaic or Arabic*.—(According to demand.) Five credits; autumn, winter, spring. Gowen.

104-105-106. *Sanskrit*.—Grammar and readings in the Nala, Hitopadeca and Veda. Five credits; autumn, winter, spring. Gowen.

114. *History of Religion I*.—Primitive conceptions of religion: naturism and spiritism. Three credits; autumn. Gowen

115. *History of Religion II*.—The religions of the Far East. Three credits; winter. Gowen.

116. *History of Religions III*.—Judaism, Christianity, Muhammadanism. Three credits; spring. Gowen.

120. *Problems of the Pacific I*.—The political and diplomatic situations outstanding between America, Japan, China, The Philippines and the European nations on the Pacific. Two credits; autumn. Hall.

121. *Problems of the Pacific II*.—As above, specializing on economic, commercial and cultural situations. Two credits; winter. Hall.

PAINTING, SCULPTURE AND DESIGN

Philosophy Hall

A student who has received the degree of Bachelor of Fine Arts with a major in painting may become a candidate for the degree of Master of Fine Arts. In lieu of the ordinary thesis, the candidate will undertake a problem in painting of a professional character.

Candidates who have not had some experience in studying original masterpieces of art will ordinarily be required to spend additional time at a recognized art museum, and to present evidence of study therein. Students working for this degree are expected to be familiar with the history of art, theories of art and aesthetics, and to have an adequate scientific foundation.

COURSES FOR UNDERGRADUATES AND GRADUATES

101, 102. *Public School Art*.—Problems in representation, design, and industrial art. Prerequisites, 5, 6, 7, 53, 54, 55. Adapted to grade, junior high, and high school courses. Methods of presentation. Two credits a quarter; autumn and winter. Rhodes.

103, 104. *Pottery*.—Lab. fee, \$2. Prerequisites, 9, 10, 11, 5, 6, 7. Three credits a quarter; autumn and winter. Worman.

105. *Art Structure*.—Design as applied to lettering. Prerequisites, 9, 10, 11, and 5, 6, 7. Three credits; autumn. Edens.

106. *Art Structure*.—Poster designing. Prerequisites, 9, 10, 11, and 5, 6, 7. Three credits; winter. Edens.

107, 108, 109. *Portrait Painting*.—Lab. fee, \$3. Prerequisites, 56, 57, 58. Three credits a quarter; autumn, winter, spring. Patterson.

110, 111, 112. *Interior Decorating*.—Prerequisites, 9, 10, 11, 56, 57, 58. Three credits a quarter; autumn, winter, spring. Foote.

116, 117, 118. *Illustration*.—Book decoration. Prerequisites, 9, 10, 11, 56, 57, 58. Lab. fee, \$3. Three credits a quarter; autumn, winter, spring. Storm.

122, 123, 124. *Sculpture*.—Lab. fee, \$3. Prerequisites, 72, 73, 74. Three credits; autumn, winter, spring. Lewis.

*126, 127, 128. *History of Painting.*

151, 152. *Art Structure*.—Wood block, linoleum printing and monotypes. Landscape and figure composition. Prerequisite, junior standing. Three credits a quarter; winter and spring. Rhodes.

157. *Metal Work*.—Etching, sawing and hammering of copper and brass. Lab. fee, \$2. Prerequisites, 53, 54, 55. Three credits; autumn. Edens.

158. *Jewelry*.—Lab. fee, \$2. Prerequisite, 157. Three credits; winter. Edens.

**159. *Jewelry*.—Prerequisite, 158. Three credits; winter. Edens.

160, 161, 162. *Life*.—Lab. fee, \$3. Prerequisite, junior standing. Three credits a quarter; autumn, winter, spring. Isaacs.

163, 164, 165. *Composition*.—Pictorial composition in charcoal and oil painting. Prerequisite, junior standing. Three credits a quarter; autumn, winter, spring. Isaacs.

*166, 167, 168. *Art Structure*.

169, 170, 171. *Costume Design*.—Prerequisites, 9, 10, 11. Two credits a quarter; autumn, winter, spring. Edens.

172, 173, 174. *Interior Decoration*.—Advanced problems in interior decoration in elevation and perspective. Five credits per quarter; autumn, winter, spring. Foote.

175, 176, 177. *Advanced Painting*.—Lab. fee, \$3. Prerequisites, 56, 57, 58. Three credits a quarter; autumn, winter, spring. Isaacs, Patterson.

179, 180, 181. *Costume Design*.—Prerequisites, 171. Two credits; autumn, winter, spring. Edens.

COURSES FOR GRADUATES ONLY

207, 208, 209. *Portrait Painting*.—In this course the student will do work of ample size and of a professional character. Lab. fee, \$3. Five credits a quarter; autumn, winter, spring. Patterson.

260, 261, 262. *Advanced Painting*.—An intensive course in painting from life. Lab. fee, \$3. Five credits a quarter; autumn, winter, spring. Isaacs.

263, 264, 265. *Composition*.—The designing and execution of pictorial and decorative compositions. Lab. fee, \$3. Three to five credits a quarter; autumn, winter, spring. Isaacs.

PHARMACY

Bagley Hall

The College of Pharmacy is well supplied with apparatus and library facilities to carry on systematic research work. An extensive garden of medicinal plants located on the campus furnishes a wealth of material for investigation along chemical and pharmacognosy lines. On account of intimate relations of the college with state and federal food and drug investigations much research material becomes available. One of the pharmacy faculty is a member of the revision committee of the United States Pharmacopoeia and hence brings the college in touch with the many research problems involved in the revision of this important book.

*Not offered in 1925-1926

**Will be offered if a sufficient number of students elect the course.

Fellowship.—One of the Arthur A. Denny fellowships is open to students of the College of Pharmacy who are graduates of the four-year course in pharmacy. This pays the sum of \$500 a year.

Admission.—Candidates for the degree of master of science must have received the bachelor's degree from the University of Washington College of Pharmacy or some other college of equal rank maintaining a four-year course which is the equivalent of the course at this institution.

Requirements for Degree of Master of Science in Pharmacy.—Not more than 22 credits allowed outside of the department of pharmacy. Election may be made in one or more of the following studies: bacteriology, botany, chemistry, physics, zoology.

Not less than 23 credits shall be elected in the department of pharmacy. At least 12 credits of the major work must be a research problem and the preparation of a thesis. Examination and thesis must conform to the regulation of the Graduate School.

Students wishing to take the degree of doctor of philosophy with the thesis in the pharmaceutical field, shall take it under the auspices of the department of chemistry, writing the thesis under the pharmaceutical members of that department.

COURSES FOR UNDERGRADUATES AND GRADUATES

112. *Materia Medica.*—Advanced course in materia medica dealing largely with animal drugs and biological products. Three credits; spring.

Goodrich.

113, 114, 115. *Advanced Prescriptions.*—Difficult and incompatible prescriptions. Special problems in dispensing, and new and non-official remedies. Manufacture of diagnostic reagents. Two lectures, one quiz and two laboratory periods. Lab. fee, \$6.50 a quarter. Five credits; autumn, winter, spring.

Langenhan and assistants.

125, 126, 127. *Current Problems.*—Lectures and recitation in current pharmaceutical problems, commercial and scientific. Use is made of the current number of most of the pharmaceutical journals published in the United States, and of several medical journals. One credit; autumn, winter, spring.

Langenhan.

195, 196, 197. *Pharmaceutical Chemistry.*—The pharmacy and chemistry of alkaloids, glycosides, oils, volatile oils and other plant and animal principles of pharmaceutical importance. The course will also include the separation and identification of poisons from animal tissue. Two lectures and three laboratory periods. Lab. fee, \$6.50 a quarter. Five credits; autumn, winter, spring.

Lynn.

201, 202, 203. *Investigation.*—Senior and graduate students may undertake original investigation in pharmacy, pharmaceutical chemistry, pharmacology, volatile oils and plant principles under the direction of an instructor. Laboratory fee according to credit and type of work. Credit to be arranged. Autumn, winter, spring. Lynn, Langenhan, Goodrich, Johnson.

PHILOSOPHY

Philosophy Hall

101-102-103. *History of Philosophy.*—Ancient, medieval and modern. Three credits a quarter; autumn, winter, spring.

Blake.

104-105-106. *Metaphysics.*—The nature of reality, with special reference to the concepts and principles of science. For advanced students in philosophy or in the physical or biological sciences. Three credits a quarter; autumn, winter, spring.

Savery.

113. *Philosophy of Religion*.—(1) The religious experience: the origin, nature and types of religion, and its effect on individual happiness and morality. The social aspect of religion and the religion of democracy. Study of mystical experiences. (2) The truth of religion: the proofs of the existence of God, the basis of faith, pessimism, optimism and meliorism, immortality. Discussion of agnosticism. Prerequisite, Phil. 1. Five credits; spring. Savery.

Oriental Languages and Literature. 114, 115, 116. *History of Religion*.—Autumn quarter: Primitive conceptions of religion, the religions of Egypt and the Euphrates Valley. Winter quarter: Religions of the Far East. Spring quarter: Judaism, Muhammadanism, and Christianity. Three credits a quarter; autumn, winter, spring. (May be counted for credit in philosophy.) Gowen.

*123. *Philosophy in English Literature of the Nineteenth Century*.

129. *Esthetics*.—Theories of the nature of Art, the nature of Beauty, and the various sources of esthetic effect. Five credits; autumn. Ducasse.

133. *Ethical Theory*.—An advanced course in the fundamental concepts and principles of ethics. Prerequisite, Phil. 2 or 3. Two credits; spring. Savery.

141-142-143. *Contemporary Philosophy*.—Modern movements and controversies. Readings and discussions on pragmatism, new intuitionism, mysticism, philosophy of faith, fate and free will, mechanism and vitalism, materialism and idealism, the finite and infinite, the new realism, etc. Two credits a quarter; autumn, winter, spring. Blake.

191, 192, 193. *Advanced Logic*.—Some study of symbolic logic. Critical examination of a number of logical doctrines bearing on philosophical questions. Inductive method as applied to the investigation of philosophical problems, with illustrations. Prerequisite, Phil. 5. Two or three credits a quarter; autumn, winter, spring. (Graduate credit may be given for this course by special arrangement with the instructor.) Ducasse.

COURSES FOR GRADUATES ONLY

207-208-209. *Seminar in Philosophy of Science*.—An advanced study of metaphysics. Open to students upon approval of instructor. Two or three credits a quarter; autumn, winter, spring. Savery.

*241, 242, 243. *Plato and Aristotle*.

244-245-246. *Seminar in Hume and Kant*.—A critical study. Open to students upon approval of instructor. Two or three credits a quarter; autumn, winter, spring. Blake.

*247-248-249. *Seminar*.—The Philosophy of Schopenhauer and Nietzsche.

251-252-253. *Research in Philosophy*.—One to six credits a quarter; autumn, winter, spring. Savery, Ducasse, Blake.

PHYSICS

Denny Hall

101. *Introduction to Modern Theories*.—Prerequisite, Physics 3. Five credits; autumn. Anderson.

*102. *Analytical Mechanics*.

*103. *Heat*

*Not offered in 1925-1926.

105. *Electricity*.—Prerequisite, Phys. 3. Lab. fee, \$2. Five credits; winter. Brakel.

*113. *Acoustics and Illumination*.

114. *Electrical Measurements*.—For engineering students. Prerequisite, Phys. 97, 98, 99. Lab. fee, \$4. Three credits; autumn, winter, spring. Brakel.

115. *Applications of Photography to Science Work*.—Prerequisite, special permission. Lab. fee, \$5. Three credits; winter. Higgs.

160. *Physical Optics*.—Prerequisite, Physics 20 hours. Lab. fee, \$2. Five credits; spring. (Only one of the two courses, 160 and 170, will be offered.) Osborn.

167, 168, 169. *Special Problems*.—Students are admitted after consultation with the instructor. Credit arranged; autumn, winter, spring. Osborn, Brakel, Anderson.

170. *Spectroscopy*.—(See Note after 160.)

*175. *High Temperature Thermometry*.

*190. *Physics of AC and DC Circuits*.

COURSES FOR GRADUATES ONLY

200-201-202. *Dynamics*.—Two credits; autumn and winter; three credits, spring. Anderson.

*203-204. *Theoretical Electricity*.

205. *Vibratory Motion and Sound*.—Lab. fee, \$2. Three credits; winter. Osborn.

206. *Advanced Optics*.—Lab. fee, \$2. Three credits; spring. Osborn.

*207-208. *Modern Theories*.

*209. *Thermodynamics*.

*210-211-212. *Seminar*.

213-214-215. *Research*.

POLITICAL SCIENCE

Philosophy Hall

Graduate Study.—For admission to graduate courses and to candidacy for higher degrees, see the announcement of the graduate school. Candidates for higher degrees in political science must register in the graduate seminar during every quarter of their residence, and in two research seminars, one of which must be in the field of the special investigation.

UPPER DIVISION COURSES

Prerequisite: Political Science 1. Recommended: Political Science 51, 52 or 53, and one of the following courses, Economics 1, Sociology 1, History 1-2.

Group I.—Political Theory and Jurisprudence

111. *History of Political Theory*.—A comparative study of ancient, medieval and modern ideas and institutions of statehood; periods and schools in the development of political thought; recent tendencies. Three credits; autumn. George.

*Not offered in 1925-1926.

112. *American Political Theory*.—American political ideas and the fundamental characteristics of the American political system; development of political thinking in the United States; ideas of the Revolution, the Constitution, the democracies of Jefferson and Jackson, the controversy over slavery and "states' rights"; recent developments. Three credits; winter. George.

113. *Contemporary Political Thought*.—A study of recent and contemporary political ideas in Europe, America and the Orient; relation of the state to property and labor; questions of sovereignty and allegiance; recent political doctrines, including pluralism, socialism, syndicalism, etc. Three credits; spring. George.

115, 116, 117. *Readings in Political Theory*.—Readings and discussions based on political and legal writings of first importance, on great state papers, and leading court decisions. Two credits a quarter; autumn, winter, spring. George.

118. *Elementary Law*.—The development of some of the more elementary rules of the common law; the definition, sources and sanction of law; the judicial system of the United States and of the state of Washington; law and the public service. Open to pre-legal students in the lower division. Two credits; autumn. Cole.

119-120. *Jurisprudence*.—Historical development of the science of jurisprudence; comparative legal systems; legal rights and duties; legal relations; fundamental legal theories; English and American legal institutions. Open to pre-legal students in the lower division. Two credits; winter, spring. Cole.

Group II.—International Relations

121. *Foreign Relations of the United States*.—Leading American foreign policies as regards Europe, Latin America and the Far East; the cardinal principles of American diplomacy; recent applications of the Monroe doctrine; the United States and the Great War; the League of Nations, and the Treaty of Versailles; contemporary questions of foreign policy. Three credits; autumn. Martin.

122. *Administration of American Foreign Affairs*.—Organization of the Department of State; the diplomatic and consular services; American diplomatic machinery and procedure; powers of the President and Senate in foreign affairs; the making and enforcement of treaties; the war powers; American participation in international administrative and judicial agencies. Three credits; winter. Martin.

123. *International Relations*.—Evolution of the modern states system; alliances and the balance of power; leading principles of the European concert; geographic, economic, cultural, racial, psychological and social factors underlying international relations; the problems of diplomacy. Three credits; spring. Martin.

125, 126. *Principles of International Law*.—The general principles of international law as developed by custom and agreement, and as exhibited in decisions of international tribunals and municipal courts, diplomatic papers, treaties, conventions, in legislation, in the works of authoritative writers, and in the conduct of nations. Three credits a quarter; autumn, winter. Martin.

127. *International Organization and Administration*.—Early international federations; unions of nations; international conferences and commissions; international legislation; contemporary efforts at international organization, with special consideration of the League of Nations. Three credits; spring. Martin.

Group III.—National Government

151. *American National Government.*—The formation and development of the American constitutional system; government under the colonies; the executive; the Congress; the courts; parties and elections; evolution through court decisions and political practice. Three credits; autumn. Cole.

152. *American Political Parties.*—Party history; federal and state party organization; nominations and elections; party control of the legislature; the President as party leader; theory of American party divisions; American public opinion; campaign methods; party responsibility; the rise of *blocs*. Three credits; winter. Cole.

153. *Introduction to Constitutional Law.*—The American constitutional system; the American judiciary; powers of the federal government; the states and the nation; rights and duties of citizens; fundamental American constitutional doctrines; leading decisions of the supreme court. Three credits; spring. Cole.

154. *Public Finance.*—Public expenditures, revenues, debts and financial administration, with particular attention given to taxation. Three credits; autumn. Laube.

155. *Principles and Law of Public Administration.*—The rights, duties, and liabilities of public officers; the public service; relations between politics and administration; rules, regulations and general practices developed in the conduct of administrative commissions and boards; organization of executive departments; administrative problems. Two credits; autumn. Laube.

156. *European Governments and Political Institutions.*—A comparative study of European governments, mainly of the parliamentary type; the responsible ministry; relation between the executive and the legislature; the new governments of Europe. Two credits; winter. Laube.

157. *The Growth of Federalism.*—History of federalism; the modern federal state; operation of the federal principle in the United States, Switzerland, Argentine, Brazil and the British Dominions. Two credits; spring. Laube.

Group IV.—Local Government

161. *Municipal Government.*—History and growth of cities; forms of city government; the municipal council; the city courts; the city and the state; the charter; reforms in city government; present-day issues in municipal government. Three credits; autumn. Laube.

162. *Municipal Administration.*—The mayor; the city departments; the city employees; the civil service; city planning; water supply; streets and parks; waste disposal; health; police; fire protection; city revenues; education; public utilities; traffic regulation. Three credits; winter. Laube.

163. *State Government and Administration.*—Colonial origins; state constitutions; the governor; the state legislatures; relation of the state to the nation; the states and law; popular methods of legislation; organization and methods of state administration; administrative reorganization of state governments, with special reference to Washington. Three credits; spring. Laube.

COURSES FOR GRADUATES ONLY

201, 202, 203. *Graduate Seminar.*—For candidates for higher degrees in political science. Two credits; autumn, winter, spring. Staff.

211. *Seminar in Political Theory*.—Special subject for investigation: influence of Duguit and Laski on political theory. Two credits; autumn. George.

221. *Seminar in International Law and Diplomacy*.—Special subject for investigation: the reparation question. Two credits; winter. Martin.

251. *Seminar in American Government and Politics*.—Special subject for investigation: current constitutional controversies in the United States. Two credits; autumn. Cole.

261. *Seminar in Local Government*.—Special topic: administrative reorganization in the state of Washington. Two credits; spring. Laube.

PSYCHOLOGY

Philosophy Hall

101. *Physiological Psychology*.—Man's behavior viewed as a result of his neurological mechanism. Students who so desire will be offered an opportunity for individual work in dissection and microscopic study. Prerequisite, Psych. 1. Three credits; winter. Guthrie.

106. *Experimental Psychology*.—Students receive training in laboratory methods, are made familiar with the more important kinds of psychological apparatus, and perform many of the classical experiments in psychology. Prerequisite, Psych. 1. Three credits; spring. Guthrie.

109. *Mental Tests*.—Training in applying tests for intelligence and for mental analysis. The principles of experimental procedure, methods of measurement, the preparation of tests and statistical treatment of results. Essential to work in clinical psychology. Prerequisite, ten credits in psychology. Three credits; spring. Griffith.

111. *History of Psychology*.—Origin and development of psychology, beginning with the primitive conceptions of mind, and including a comprehensive view of the sources of scientific psychology. Prerequisite, Psych. 1. Two credits; autumn. Guthrie.

112. *Modern Psychological Theory*.—Criticism of psychological theories in the light of recent experimental findings. Prerequisite, Psych. 1. Three credits; spring. Guthrie.

114. *Current Psychological Literature*.—Reading and discussion in the direction of the student's particular interest, covering a wide range of subjects treated in recent journals and with the new developments in psychology. Prerequisite, Psych. 1. Two credits; winter. Guthrie.

116. *Animal Behavior*.—The mind of animals as shown by their behavior under natural conditions and in the laboratory. Prerequisite, Psych. 1. Three credits; autumn. Griffith.

118. *Folk Psychology*.—A psychological study of social human nature; language, custom, public opinion, morals, war, family, caste, nationalism, religion. Prerequisite, Psych. 1. Two credits; autumn. Guthrie.

121. *Applied Psychology*.—Psychology as applied to personal efficiency, vocational guidance, the measurement of vocational fitness, and scientific management. The significance of sex and individual differences in practical life. Each member of the class will organize his work around a problem of personal interest. Prerequisite, Psych. 1. Five credits; winter. Griffith.

124. *Psychology of Learning*.—The principles of learning and the transfer of training. Prerequisite, ten credits in psychology. Two credits; spring. Smith.

126. *Abnormal Psychology*.—The explanation of unusual behavior and the influence of the subconscious mind upon conduct. Prerequisite, ten credits in psychology. Three credits; winter. Guthrie.

131. *Child Psychology*.—Mental development from infancy to adult age with the purpose of giving the student a scientific understanding of childhood. Prerequisite, Psych. 1. Three credits; autumn. Smith.

132. *Psychology of Exceptional Children*.—The nature and cause of mental defects and peculiarities of children, with special reference to methods of diagnosis and to physical pathology. Prerequisite, Psych. 1. Three credits; spring. Smith.

151, 152, 153. *Undergraduate Research*.—Prerequisites, Psych. 1 and 106. Three credits; each quarter. Smith, Guthrie, Griffith.

Seminar.—Open to all research students in the department. Weekly meetings.

COURSES FOR GRADUATES ONLY

Before a student registers for graduate courses his program of research must be approved by the department.

201, 202, 203. *Graduate Research*. Smith, Guthrie, Griffith.

ROMANIC LANGUAGES AND LITERATURE

Denny Hall

The graduate courses in this department aim to give the student an adequate knowledge of the relation of the French, Italian and Spanish language to the Latin, and of the literatures of those languages to each other and to English literature. The graduate courses are generally conducted in the language studied.

Other opportunities for hearing and speaking French, Italian and Spanish are offered by the several clubs and societies in which those languages are used.

The library contains the principal magazines and collections necessary for work in the department, and special collections are being made to meet the demands of research work.

The Samuel Rosenberg scholarship of \$200 is annually offered for advanced work in French.

I. FRENCH

104, 105, 106. *Advanced Reading*.—Courses to be taken with 101, 102, 103, if so desired to make five-hour courses. Prerequisites, French 6 and 9. Two credits a quarter. French 101 and 104, 102 and 105 are offered each quarter; 103 and 106 are not offered in the autumn quarter.

Patzer, Helmlinge, DeVries, Whittlesey, Hamilton.

107. *Themes*.—Writing of original compositions upon assigned topics. Prerequisite, French 103, or 102 with grade of A. Those taking French 107 are not required to offer 103. Three credits; spring. Helmlinge.

118, 119, 120. *Survey of French Literature*.—Lectures in English, and collateral reading of English translation. Those who have studied French

sufficiently will be assigned French texts to read. No prerequisites. Three credits a quarter; autumn, winter, spring. DeVries.

*121, 122. *The French Novel.*

124, 125, 126. *The Short Story.*—Conducted in French. Development of the French short story from its beginnings in Old French to modern times. Masterpieces of Daudet, Maupassant, Bazin and others will be read and discussed. Prerequisite, French 6 and 9, or equivalent. Two credits a quarter; autumn, winter, spring. Helmlinge.

131, 132, 133. *Lyric Poetry.*—Conducted in French. The best lyrics since the sixteenth century, especially those of Lamartine, Hugo and Musset. Rules of French versification. Prerequisite, French 106 or equivalent. Three credits a quarter; autumn, winter, spring. Helmlinge.

141, 142, 143. *The French Drama.*—Lectures and assigned reading. Course conducted in French. Prerequisites, French 6 and 9 or equivalent. Three credits a quarter; autumn, winter, spring. Patzer.

151, 152, 153. *History of the French Literature of the Nineteenth Century.*—Lectures in French and assignments of reading to be done outside of class. Prerequisites, French 6 and 9, or equivalent. Three credits a quarter; autumn, winter, spring. DeVries.

158, 159. *Advanced Syntax.*—French Syntax from the teacher's standpoint. These courses are prerequisite to the teacher's course. Prerequisite, French 103. Two credits a quarter; autumn, winter. Frein.

*161, 162, 163. *Eighteenth Century Literature.*

171, 172, 173. *Seventeenth Century Literature.*—Course conducted in French. Survey of the entire century, but especial emphasis upon the dramas of Corneille, Moliere and Racine. Assigned outside reading, and reports. Prerequisite, French 6 and 9 or equivalent. Two credits a quarter; autumn, winter, spring. Patzer.

COURSES FOR GRADUATES ONLY

201, 202, 203. *Middle French and Sixteenth Century.*—Masterpieces of the fourteenth, fifteenth and sixteenth century will be read, and their influence upon later French literature studied. Open to graduates who have studied French at least four years. Two credits a quarter; autumn, winter, spring. Frein.

211, 212, 213. *French Criticism.*—Exposition of the several theories by which French critics have tested literature. Prerequisites, a good knowledge of French or English literature. Course given in English. Two credits a quarter; autumn, winter, spring. (May be counted for graduate credits in English.) DeVries.

221, 222, 223. *Old French Readings.*—One of the most helpful courses for teachers of French. Open to graduates who have studied French at least four years. Five credits a quarter; autumn, winter, spring. Goggio.

*231, 232, 233. *History of Old French Literature.*

241, 242, 243. *French Historical Grammar.*—Phonology, morphology, and the most summary rules of Old French syntax. Open to graduate majors of this department, to all graduates who can read Old French, and to all graduates who have had four years of Latin and at least two years of modern French. Three credits a quarter; autumn, winter, spring. Frein.

II. ITALIAN

*111, 112, 113. *Modern Italian Literature.*

*118, 119, 120. *Survey of Italian Literature.*

121, 122, 123. *The Italian Novel.*—History of the novel from its beginning. Those able to read modern Italian can read the oldest novels also. Influence of the Italian novel upon French and English literature. Prerequisite, Italian 3; three to five credits a quarter; autumn, winter, spring. Goggio.

181, 182. *Dante.*—The Divine Comedy of Dante will be read and studied to bring out the character of the imaginative and philosophical ideas contained in it, and the relations of these ideas to medieval thought. Knowledge of Italian not necessary. Two credits a quarter; autumn and winter. Goggio.

184. *Renaissance Literature of Italy.*—Stress will be laid on the works of Petrarch and Boccaccio especially, and on those of Machiavelli, Castiglione, Ariosto, Cellini, and Tasso. Lectures in English and collateral reading. Knowledge of Italian not necessary. Two credits; spring. Goggio.

COURSES FOR GRADUATES ONLY

201. *Research in Italian Literature.*—The number of credits will be determined by the amount of work done. Goggio.

III. SPANISH

101, 102, 103. *Advanced Composition.*—Prerequisite, Span. 9. Three credits a quarter; autumn, winter, spring. Sanjurjo.

*104, 105, 106. *Advanced Reading.*

118, 119, 120. *Survey of Spanish Literature.*—Selected texts, collateral reading, lectures. Prerequisite, Span. 6. Two credits a quarter; autumn, winter, spring. Umphrey.

121, 122, 123. *Spanish Novel.*—Lectures in Spanish on the history of the Spanish novel. Assigned outside reading and reports. Prerequisites, Span. 6 and 9. Two credits a quarter; autumn, winter, spring. Sanjurjo.

*131, 132, 133. *Lyric Poetry.*

*141, 142, 143. *Drama.*

159. *Advanced Syntax.*—Problems in syntax studied from the teacher's standpoint. Prerequisites, Span. 101, 102. Three credits; spring. Ober.

184, 185, 186. *Spanish American Literature.*—Representative writings of Spanish American authors. Collateral reading and reports. Lectures. Prerequisites, Span. 6 and 9. Three credits a quarter; autumn, winter, spring. Umphrey.

COURSES FOR GRADUATES ONLY

221. *Old Spanish Readings.*—Reading and linguistic study of the Poema de mio Cid and other Old Spanish texts. Five credits; autumn. Umphrey.

231. *Epic Poetry.*—The epic material in Old Spanish literature and its later treatment in poetry and drama. Topics are assigned for special investigation and report. Five credits; winter. Umphrey.

241. *Spanish Historical Grammar.*—Five credits; spring. Umphrey.

COMPARATIVE PHILOLOGY

The following courses in comparative philology are available in the department of Scandinavian Languages and Literature:

190-191. *Introduction to the Science of Language*.—Two credits; autumn, winter. Vickner.

192. *Life of Words*.—Two credits; spring. Vickner.

SCANDINAVIAN LANGUAGES AND LITERATURE

Denny Hall

103, 104, 105. *Recent Swedish Writers*.—Representative writers of the nineteenth and twentieth centuries, including Strindberg, Fröding, Selma Lagerlöf. May be entered any quarter. Two credits a quarter; autumn, winter, spring. Vickner.

106, 107, 108. *Recent Norwegian-Danish Writers*.—Representative writers of the nineteenth and twentieth centuries are read, including Ibsen, Bjørnson, Kielland, Jacobsen, Hamsun, Bojer. May be entered any quarter. Two credits a quarter; autumn, winter, spring. Vickner.

180, 181, 182. *Recent Scandinavian Literature in English Translation*.—The principle writers of recent Scandinavian literature will be read. Lectures, reports and discussion. May be entered at the beginning of any quarter. Two credits; autumn, winter, spring. Vickner.

COURSES FOR GRADUATES ONLY

*201-202. *Old Icelandic*.

SOCIOLOGY

Philosophy Hall

Opportunities for advanced study and investigation are offered along the following lines:

Social Problems and Social Reconstruction.—Research and investigation on matters of community and industrial welfare are open to graduate students. Field work with local social agencies is conducted under competent supervision. Arrangements have been made for training in the practical handling of cases with the Social Welfare League, Juvenile Court, Anti-Tuberculosis League, etc.

Social Theory and Methods of Investigation.—A statistical laboratory is available under direction of the department of mathematics. Psychological analysis is promoted in conjunction with the clinic and laboratory of the department of psychology. A joint seminar is provided for candidates for advanced degrees.

Graduate students must complete undergraduate requirements before being accepted as candidates for the master's or doctor's degree in sociology.

COURSES FOR UNDERGRADUATES AND GRADUATES

105. *Industrial Groups*.—Survey of the conditions making for disharmonies of relationship between management and the worker. Case studies of social and individual experiments in industrial reorganization. Five credits; autumn. McKenzie.

*Not offered in 1925-1926.

130. *Social Surveys*.—Methods of planning, conducting, and presenting results of investigations of communities and institutions. Critical consideration of current methods. Lectures, problems, field work. Five credits; autumn. Lundberg.

131. *Social Statistics*.—Methods and sources for quantitative investigation, as applied to ethnography, demography, vital statistics, social maladjustment, and their related fields. Five credits; winter. Lundberg.

132. *Social Aspects of Publicity*.—Technique of preparing and exhibiting sociological data pertaining to community problems. Publicity devices, exhibits, and campaigns. Five credits; spring. Lundberg.

150. *General Sociology*.—Major concepts of sociology and the scientific point of view in dealing with social phenomena. Five credits; autumn. (This course open to upper division students without course 1, by permission.) Bain.

151. *Social Conflict*.—Meaning, causes, types and significance of social conflict. Analysis of conflict situations. Five credits; winter. Bain.

152. *Social Control*.—Technique of corporate action—meaning, process and agencies of social control. Five credits; spring. Bain.

153. *Problems of Poverty*.—History of poverty and relief. Individual and social causes underlying destitution. Modern methods of approach to the problems of prevention and relief. Three credits; autumn. Lundberg.

154. *Charity Organization and Administration*.—Principles and problems of public and private relief administration. Units of administration and supervision. Survey and evaluation of current types of organization and administration. Three credits; winter. Lundberg.

155. *Social Legislation*.—History, principles, and trends of social legislation. Critical study of representative types and programs. Three credits; spring. Lundberg.

156. *Criminology*.—Social, economic, and hereditary causes of crime; various theories and plans of prison reform; the relations of prisons and criminals to society. Five credits; spring. McKenzie.

157. *Social Pathology*.—The social factors involved and the methods of dealing with physical defectiveness, feeble-mindedness, insanity, narcotics, alcoholism, prostitution, vagrancy. Five credits; winter. McKenzie.

160, 161, 162.—*Relief, Reform, Reconstruction*.—A summary of current programs of social betterment with critical estimate of their value for progress. Three credits; autumn, winter, spring. Woolston.

171-172-173. *Social Work Practice I*.—Supervised field work with local social agencies. Twelve hours field work, two hours class. Permission of instructor required for admission. Five credits; autumn, winter, spring. Johnson.

180, 181, 182. *Group Behavior*.—Introduction to social psychology; local and national traits. Five credits a quarter; autumn, winter, spring. Woolston.

191-192-193. *Social Work Practice II*.—Advanced field work. Twelve hours field work; two hours class. Prerequisite, 171-172-173, or equivalent. Five credits; autumn, winter, spring. Johnson.

194. *Early Social Thought*.—Primitive times to St. Augustine. Social thought in China, Japan, India, Mesopotamia (Palestine and Persia), Egypt, Greece, Rome, Peru, and Mexico. Three credits; autumn. Bain.

195. *Middle Social Thought*.—Fall of Rome to Spencer. Social thought during the Dark Ages, Renaissance, Reformation, Revolution and Post-Darwinian periods. Three credits; winter. Bain.

196. *Recent Social Thought*.—Since Spencer. Particular attention will be given to the social theories of men now living in England, America, France, Germany and Russia, the approach being conceptual, instead of chronological as in 194 and 195. Three credits; spring. Bain.

COURSES FOR GRADUATES ONLY

207-208-209. *Community Research*.—Original investigation of special community problems. Two credits a quarter; autumn, winter, spring. McKenzie.

221-222-223. *Seminar*.—The purpose is to train in methods of original research and investigation. Two credits; autumn, winter, spring. Woolston.

ZOOLOGY

Science Hall

The department offers facilities for graduate work in most of the well established lines of investigation in the field of zoology. Proximity to the sea gives unusual opportunity for research based upon marine material. In this connection the Puget Sound Biological Station of the University, located at Friday Harbor in the midst of a fauna of extraordinary richness, offers a most inviting base for the study of taxonomy, embryology, and ecology of marine organisms. The campus of the University borders upon Lake Washington, one of the largest bodies of fresh water in the Northwest, which, with its associated streams and marshes provide an excellent opportunity for plankton investigations. Since the climatic conditions are such that ice rarely forms, field work can be conducted during all seasons of the year. In cooperation with the College of Fisheries many problems arising from the application of biological principles to the fishing industries call for solution at the hands of those possessing the requisite training in zoology and allied sciences.

Owing to the topography of the western portion of the state there exists within narrow geographic limits an extraordinary diversity of conditions controlling the distribution and adaptation of animal life. A journey of a few hours duration of railway or automobile enables one to traverse the entire range of conditions from sea level to the lofty slopes of the Cascade or Olympic Mountains. This leads to a remarkable diversity of faunistic elements and offers a rather unique opportunity for the study of the relation between terrestrial organisms and their environment, particularly insects, birds and mammals.

*101. *Cytology*.—The structure and activities of the animal cell with special reference to problems of development, sex-determination, and heredity. Prerequisite, Zool. 1-2 or 3-4. Lab. fee, \$2. Five credits; spring. Offered 1924-25 and alternate years. Miller.

102. *Experimental Zoology*.—An experimental study of the organism as a dynamic unit, including problems of development, growth and regeneration, and response to external factors. Prerequisite, Zool. 1-2 or 3-4. Lab. fee, \$2. Five credits; spring. Offered 1925-1926 and alternate years. Miller.

106. *Plankton*.—Classification, adaptations and interrelationships of the microscopic fauna of the sea. Field work in Puget Sound. Prerequisite, Zool. 1-2. Lab. fee, \$2. Five credits; autumn. Kincaid.

107. *Parasitology*.—Animal parasites. Prerequisite, Zool. 1-2 or 3-4. Lab. fee, \$2. Five credits; spring. Guberlet.

*Not offered in 1925-1926.

108. *Limnology*.—Classification and interrelationship of the organisms found in lakes and streams. Field work in the neighboring fresh-water bodies. Prerequisite, Zool. 1-2. Lab. fee, \$2. Five credits; spring.

111. *Entomology*.—The structure, classification and economic relations of insects. Prerequisite, Zool. 1-2 or equivalent. Lab. fee, \$2. Five credits; spring. Kincaid.

121. *Microscopic Technique*.—Methods of imbedding, sectioning and staining animal tissues. Prerequisite, Zool. 1-2 or its equivalent. Lab. fee, \$2. Three credits; winter. Guberlet.

125, 126. *Invertebrate Zoology*.—The morphology, physiology, life history and habits of invertebrate animals, with special reference to the local marine fauna. Prerequisite, Zool. 1-2 or 3-4. Lab. fee, \$3.50. Five credits a quarter; autumn, winter. Offered 1925-1926 and alternate years.

*127, 128. *Comparative Anatomy*.—Comparative structure of the vertebrate animals. Prerequisite, Zool. 1-2 or 3-4. Lab. fee, \$2. Five credits a quarter; autumn, winter. Offered 1924-1925 and alternate years. Miller.

**155-156-157. *Elementary Problems*.—Students will be assigned minor problems under direction of an instructor in the department. Prerequisite, twenty hours in zoology or physiology. Lab. fee, \$2. Three credits, autumn, winter, spring. Kincaid, Smith, Guberlet, Miller.

COURSES FOR GRADUATES ONLY

201-202-203. *Research*.—Students capable of carrying on independent work will be assigned problems under direction of an instructor. Prerequisite, twenty-five hours of zoology. Credit to be arranged. Kincaid, Smith, Miller.

PHYSIOLOGY

115. *Principles of General Physiology*.—Application of the laws of physics and chemistry to physiological processes. Prerequisite, one year each, zoology, chemistry and physics. Lab. fee, \$2.50. Five credits; spring. Smith

151-152-153. *Advanced Physiology*.—Arranged for students in medicine and advanced students who wish to make a careful study of experimental methods. Prerequisites, Zool. 2 or 4, Chem. 23 and Physics 3. Lab. fee, \$4. Five credits; autumn, winter, spring. Smith.

*Not offered in 1925-1926.

**Will be offered if a sufficient number of students elect the course.

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